FIFTH EDITION

aerospace BIBLIOGRAPHY

COMPILED FOR NATIONAL AERONAUTICS AND SPACE ADMINISTRATION BY NATIONAL AEROSPACE EDUCATION COUNCIL

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JANUARY, 1970

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NATIONAL AERONAUTICS
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EDUCATION COUNCIL

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price $1.00

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preface

With the publication of the Fifth Edition of the AEROSPACE BIBLIOGRAPHY, the National Aeronautics and Space Administration presents to elementary and secondary school teachers and to general adult readers an updated list of books, references, periodicals, and other educational materials related to space flight and space science. The arrangement of this Fifth Edition differs markedly from that of previous editions, and represents an effort to make the bibliography more useful. Users are advised to refer first to *Part I—Subject Index* to locate books and materials (pamphlets, charts, pictures, models, maps, leaflets, kits, etc.) on a particular subject, and at a particular suggested reading level. Details about each item listed in the Subject Index may then be found in *Part II—Annotated Bibliography,* which lists all items alphabetically by author or source.

The suggested reading, or usage, level of each item is designated by code letters as follows: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; and (A) college or adult. Prices quoted are list prices at the time of publication of this bibliography.

For the most part, books listed in this bibliography bear copyright dates beginning with 1967 through fall 1969. A few semi-technical books have been included for those readers who wish to pursue a subject in depth. Also, a few out-of-print materials are listed, as they are considered still relevant and may be located in libraries. Aeronautical titles are limited to those dealing with aeronautical research subjects such as the sonic boom, V/STOL aircraft, the supersonic transport (SST); jet engine noise, etc. For a broader coverage of aeronautical titles and materials, the reader is referred to the *Aviation Education Bibliography* published by the National Aerospace Education Council. (See page 54.) Users of this bibliography also are urged to consult the *Reader's Guide to Periodical Literature* to locate additional sources of information on space subjects.

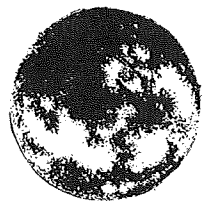
Orders for books and sale items, and requests for free materials should be sent to the appropriate publisher or supplier whose addresses are listed on pages 87-94.

The books and teaching aids appearing in this bibliography comprise only a partial listing; therefore, this bibliography should not be considered as complete or exhaustive. The listing of any item should not be construed as an endorsement by either the National Aeronautics and Space Administration or by the National Aerospace Education Council, compiler.

Users of this bibliography are invited to send to NASA their suggestions for improvement in format, arrangement, or content for consideration in compiling future editions. Suggestions may be sent to the Publications Officer, Educational Programs Division, Office of Public Affairs, Code FE, NASA, Washington, D.C. 20546.

The National Aerospace Education Council acknowledges with thanks the assistance of representatives of the many publishers, organizations, government agencies, and private firms whose cooperation in compiling this bibliography was solicited and most courteously extended.

subject index



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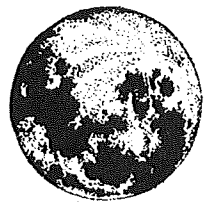

PART I — SUBJECT INDEX

Items listed below are arranged alphabetically by author or source in the Annotated Bibliography that begins on page 33.

1. General Overview of Space Exploration

Books and materials in this section give the reader a general overall view of the environment of space, and the techniques and accomplishments of space exploration. They are of an introductory nature and generally present a comprehensive survey of space and space exploration. For items with more detailed and specialized information about particular areas of the space program, consult Part I of the Table of Contents.

Aerojet General Corporation. SPACELINES . . . an examination of America's activities in space. (U-S-A)

Aerospace Corporation. SPACE PRIMER. (U-S)

Anderson, Poul. THE INFINITE VOYAGE. 1969. (U-S-A)

Asimov, Isaac. THE ABC's OF SPACE. 1969. (P)

Barbour, John. FOOTPRINTS ON THE MOON. 1969. (U-S-A)

Bergaust, Erik. THE RUSSIANS IN SPACE. 1969. (U-S)

Berman, Louis. AMERICAN ROCKETRY. 1967. (U-S)

Bernardo, James V. AVIATION AND SPACE IN THE MODERN WORLD. 1968. (S-A)

Braun, Wernher von. SPACE FRONTIER. 1967. (S-A)

Bruce, Lois. SPACE ABC. 1967. (I-U)

Butler, S. T. and H. Messel. APOLLO AND THE UNIVERSE. 1968. (S)

Clarke, Arthur. THE COMING OF THE SPACE AGE. 1967. (S-A)

———— MAN AND SPACE. 1968. (U-S-A)

Conroy, Charles W. and Harold E. Mehrens. THE DAWNING SPACE AGE. (S-A)

Dolezal, Erich. CONQUEST OF SPACE. 1969. (U-S)

Feravolo, Rocco V. AROUND THE WORLD IN NINETY MINUTES: JOURNEY OF TWO ASTRONAUTS. 1968. (P)

Field Enterprises Educational Corporation. EXPLORING SPACE. (A)

———— SPACE TRAVEL. 1970. (U-S-A)

George, Frances. YOU AND SPACE. (P)

Hendrickson, Walter B., Jr. WHAT'S GOING ON IN SPACE? 1968. (I)

Highland, Harold. HOW AND WHY WONDER BOOK OF PLANETS AND INTERPLANETARY TRAVEL. 1969. (I-U)

Hyde, Margaret O. EXPLORING EARTH AND SPACE. 1967. (I-U)

Keen, Martin. THE WONDERS OF SPACE: ROCKETS, MISSILES, AND SPACECRAFT. 1967. (I-U)

Kennan, Erland A. and Edmund H. Harvey, Jr. MISSION TO THE MOON. 1969. (A)

Krieger, S. J. SPACE PROGRAMS OF THE SOVIET UNION. 1967. (S-A)

Leavitt, William and others. THE SPACE FRONTIER WITH ASTRONAUTICS GLOSSARY. (U-S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

Lewis, Richard S. APPOINTMENT ON THE MOON: The Inside Story of America's Space Program. 1969. (S-A)

Ley, Willy. ROCKETS, MISSILES AND MEN IN SPACE. 1968. (S-A)

Newell, Homer E., Jr. SPACE BOOK FOR YOUNG PEOPLE. 1968. (I-U)

Revell Educational Systems. PICTURE SET. (P-I-U-S)

Sheldon, Charles S. II. REVIEW OF THE SOVIET SPACE PROGRAM: With Comparative United States Data. 1968. (S-A)

Shelton, William R. AMERICAN SPACE EXPLORATION: The First Decade. 1967. (S-A)

———— SOVIET SPACE EXPLORATION: The First Decade. 1968. (A)

———— MAN'S CONQUEST OF SPACE. 1968. (U-S-A)

Silverberg, Robert. THE WORLD OF SPACE. 1969. (U-S)

Times Mirror School and Library Service. STUDY PRINTS. (P-I-U)

Tudor Publishing Company. SPACE AGE. (P-I-U-S)

U. S. Atomic Energy Commission. SOVIET SPACE PROGRAMS, 1962–1965; Goals and Purposes, Achievements, Plans and International Implications. 1967. (S-A)

U. S. House of Representatives. Committee on Science and Astronautics. REVIEW OF THE SOVIET SPACE PROGRAM WITH COMPARATIVE UNITED STATES DATA. 1967. (A)

U. S. National Aeronautics and Space Administration. AMERICA IN SPACE: THE FIRST DECADE. (S-A)

———— PICTURE SET 3, "Eyewitness to Space." (P-I-U-S-A)

———— SPACE: THE NEW FRONTIER. 1966. (U-S-A)

Zaffo, George J. THE GIANT BOOK OF THINGS IN SPACE. 1969. (P)

2. Research, Development and Manufacturing of Space Hardware

Books and materials listed under this heading are concerned with the design and construction of space hardware, the industry and government space research laboratories, and the manufacturing plants involved in the building of rockets, spacecraft, and their systems and equipment. Also included are materials useful in college-level courses in space systems design.

Abraham, L. H. SPACE TECHNOLOGY. Volume 1. Spacecraft Systems. 1965. (A)

AC Electronics. FLY ME TO THE MOON. (U-S-A)

———— GUIDING MEN TO THE MOON. (S-A)

Adams, James L. SPACE TECHNOLOGY. Volume 2. Spacecraft Mechanical Engineering. 1965. (A)

Aerojet General Corporation. SPACELINES . . . an examination of America's activities in space. (U-S-A)

Bell Telephone Company. SIGNALS IN SPACE. (S-A)

Holder, William G. SATURN V. THE MOON ROCKET. 1969. (U-S-A)

Isaacs, Theodore. PROJECT NERO. 1967. (A)

Jet Propulsion Laboratory. PIONEERING IN SPACE. (S-A)

Kleiman, Louis A. PROJECT ICARUS. 1968. (A)

Meeter, George F. THE HOLLOMAN STORY. 1967. (S-A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

National Geographic Society. MACHINES GIVE MEN RUNNING START IN LEAP TO THE MOON. Volume 46, No. 25, March, 18, 1968. (I-U)

RCA. SPACE PROGRAMS. (S-A)

Scull, J. R. SPACE TECHNOLOGY. Volume IV. 1967. (A)

Seamans, Robert C., Jr. ACTION AND REACTION. 1969. (A)

Society for Visual Education. BUILDING TOWARD THE MOON. (I-U-S)

Stiffler, J. J. SPACE TECHNOLOGY. Volume V: Telecommunications. 1967. (A)

U. S. National Aeronautics and Space Administration. "IN THIS DECADE . . ." MISSION TO THE MOON. (U-S-A)

_____ NASA FACTS ORGANIZATION SERIES. (S-A)

_____ SIMULATORS. (U-S-A)

_____ THIS IS NASA. (S-A)

Useller, James W. CLEAN ROOM TECHNOLOGY. 1969. (S-A)

Webb, James E. SPACE AGE MANAGEMENT. 1969. (A)

3. Space Flight Facilities

The books and materials in this section describe NASA and Soviet launch sites, the tracking and communications network, and the optical and radio telescopes—all of which play major roles in all space missions.

Coombs, Charles. SPACETRACK. 1969. (I-U-S)

Hayes, E. Nelson. TRACKERS OF THE SKIES. 1968. (A)

Hynek, Allen. EXPLORING THE UNIVERSE. 1968. (U-S)

Lovell, Bernard. THE STORY OF JODRELL BANK. 1968. (S-A)

National Geographic Society. RADIO TELESCOPES HELP BOY EAVESDROP ON THE STARS. Volume 47, No. 20, February 10, 1969. (I-U)

Pope, Billy N. and Ramona W. Emmons. LET'S VISIT A SPACESHIP. 1968. (P-I)

Pursell, Carroll W., Jr. ASTRONOMY IN AMERICA. 1967. (U-S)

Sheldon, Charles S. II. REVIEW OF THE SOVIET SPACE PROGRAM: With Comparative United States Data. 1968. (S-A)

Smithsonian Astrophysical Observatory. SPACE SCIENCES AND SATELLITE TRACKING AT THE SMITHSONIAN. (S-A)

Society for Visual Education. BUILDING TOWARD THE MOON. (I-U-S)

Taylor, L. B., Jr. LIFTOFF! 1968. (S-A)

U. S. National Aeronautics and Space Administration. COUNTDOWN. Elementary: General Science. (I-U)

_____ NASA FACTS ORGANIZATION SERIES. (S-A)

#0–5 NASA Goddard Space Flight Center
#0–6 NASA John F. Kennedy Space Center
#0–9 NASA Manned Spacecraft Center
#0–10 NASA George C. Marshall Space Flight Center

_____ THIS IS NASA. (S-A)

_____ VENTURE INTO SPACE. Early Years of Goddard Space Flight Center. 1968. (S-A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

4. Propulsion and Power Systems for Spacecraft

A. Propulsion Systems

Books and materials listed in this section furnish information about the principles of rocketry, types of rockets and launch vehicles, rocket fuels, thrust, the history of rockets, and other related topics. Materials on model rocketry are also included, as are sources of scale model rockets.

Aerospace Corporation. SPACE PRIMER. (U-S)

American Institute of Aeronautics and Astronautics. BUILDING YOUR OWN ROCKET? (U-S-A)

Barrowman, James. CALCULATING THE CENTER OF PRESSURE OF A MODEL ROCKET. 1968. (U-S-A)

———— STABILITY OF A MODEL ROCKET IN FLIGHT. 1968. (U-S-A)

Berman, Louis. AMERICAN ROCKETRY. 1967. (U-S)

Carey, David. THE ROCKET. 1967. (I-U)

Centuri Engineering Company. CENTURI MODEL ROCKET PRODUCTS CATALOG. (S-A)

———— STUDENT'S GUIDE TO MODEL ROCKETRY. 1969. (U-S-A)

Civil Air Patrol. ROCKET AND MISSILE IDENTIFICATION: A PROGRAMMED LEARNING EXERCISE. (U-S-A)

Conroy, Charles W. and Harold E. Mehrens. THE DAWNING SPACE AGE. 1963. (S-A)

Denoyer-Geppert Co. ROCKET chart. (U)

———— ROCKETS AND SATELLITES. (U)

Estes Industries. ESTES Model Rocket Supplies Catalog. (U-S-A)

———— SATURN V model rocket. (U-S-A)

Flight Systems, Inc. CATALOG of Model Rocket Supplies. (U-S-A)

Hawk Model Company. JUPITER-C ROCKET. (I-U-S)

Hertz, Louis H. THE COMPLETE BOOK OF MODEL AIRCRAFT, SPACECRAFT AND ROCKETS. 1967. (S-A)

Holder, William G. SATURN V. THE MOON ROCKET. 1969. (U-S-A)

Hunter, Maxwell W. II. THRUST INTO SPACE. 1966. (S)

Keen, Martin. THE WONDERS OF SPACE: ROCKETS, MISSILES, AND SPACECRAFT. 1967. (I-U)

Malewicki, Douglas. MODEL ROCKET ALTITUDE PERFORMANCE. 1968. (U-S-A)

May, Julian. ROCKETS. 1967. (P)

Monogram Models, Inc. APOLLO-SATURN. (U-S)

National Association of Rocketry. MODEL ROCKETRY. (U-S-A)

Revell Educational Systems. PICTURE SET. (P-I-U-S)

Rocket Research Institute, Inc. ROCKET SAFETY EDUCATOR. (S-A)

Stine, G. Harry. A HANDBOOK OF MODEL ROCKETRY. 1967. (U-S-A)

U. S. National Aeronautics and Space Administration.

———— SATURN V. (P-I-U-S-A)

———— SPACE LAUNCH VEHICLES. (U-S-A)

———— SPACE: THE NEW FRONTIER. 1966. (U-S-A)

———— U.S. LAUNCH VEHICLES FOR PEACEFUL EXPLORATION OF SPACE. (P-I-U-S-A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

B. Power Systems

Books and materials in this section offer information about devices that provide power to spacecraft such as solar cells, fuel cells, and batteries.

Austin, L. G. FUEL CELLS. 1967. (S-A)

Edmund Scientific Company. SOLAR CELL EXPERIMENT SET. (S)

U. S. National Aeronautics and Space Administration. BATTERIES FOR SPACE POWER SYSTEMS. 1968. (S-A)

_____ ELECTRIC POWER GENERATION IN SPACE. (S-A)

_____ SOLAR CELLS. High School: Physical Science. (S)

5. Communications, Guidance and Control

Books and materials in this section explain the various ground-based and spaceborne systems that provide communication, guidance, and control for spacecraft. Topics include inertial guidance systems, space navigation, stabilization of spacecraft, temperature and humidity controls, radar, target tracking, radio, telemetry devices and computers.

AC Electronics. FLY ME TO THE MOON. (U-S-A)

_____ GUIDING MEN TO THE MOON. (S-A)

_____ INERTIAL GUIDANCE IN THE SPACE AGE. (S-A)

Adams, James L. SPACE TECHNOLOGY. 1965. (A)

Bell System. SIGNALS IN SPACE. (S-A)

Brite, Robert J. and Carolo H. Fioranelli. SYNCHROS AND SERVOS. (A)

Communications Satellite Corporation. NEW COMMUNICATIONS ERA. (U-S-A)

Corliss, William R. and Edwin G. Johnsen. TELEOPERATOR CONTROLS. 1968. (A)

Gates, Robert L. INERTIAL GUIDANCE SYSTEMS. 1968. (S-A)

Hellman, Hal. CONTROLLED GUIDANCE SYSTEMS. 1967. (S-A)

Honeywell. APOLLO. Stabilization and Control. (S-A)

Hymoff, Edward. GUIDANCE AND CONTROL OF SPACECRAFT. 1966. (S)

Independent Tracking Coordination Program. SATELLITE PREDICTION INFORMATION. (S-A)

International Business Machines Corporation. COMPUTERS IN ACTION: TEN DAYS THAT MADE SPACE HISTORY. (U-S)

RCA. SPACE PROGRAMS. (S-A)

Scull, J. R. SPACE TECHNOLOGY. 1967. (A)

Stiffler, J. J. SPACE TECHNOLOGY. 1967. (A)

U.S. National Aeronautics and Space Administration. LINKING MAN AND SPACECRAFT. (S-A)

_____ SPACECRAFT TRACKING. (S-A)

_____ SPACECRAFT TRACKING AND COMMUNICATIONS. Jr. High School: General Science. (U-S)

_____ SPACE NAVIGATION. (U-S-A)

_____ TELEMETRY. Jr. High School: General Science. (U-S)

6. Unmanned Exploration of Space

Books and materials in this section provide information about the operation, purposes, and accomplishments of communications, navigation, and meteorological Earth satellites, lunar and planetary space probes, and the great variety of scientific spacecraft that carry instruments into space to measure space phenomena.

A. General Information

Denoyer-Geppert Company. ROCKETS AND SATELLITES. (U)

Hynek, Allen. EXPLORING THE UNIVERSE. 1968. (U-S)

Jet Propulsion Laboratory. PIONEERING IN SPACE. (S-A)

Krieger, S. J. SPACE PROGRAMS OF THE SOVIET UNION. 1967. (S-A)

Naugle, John E. UNMANNED SPACE FLIGHT. 1965. (S)

Ross, Frank, Jr. MODEL SATELLITES AND SPACECRAFT. 1969. (U-S)

Sheldon, Charles S. II. REVIEW OF THE SOVIET SPACE PROGRAM: With Comparative United States Data 1968. (S-A)

U. S. House of Representatives. Committee on Science and Astronautics. REVIEW OF THE SOVIET SPACE PROGRAM WITH COMPARATIVE UNITED STATES DATA. 1967. (A)

U. S. National Aeronautics and Space Administration. APPLICATIONS TECHNOLOGY SATELLITES. (S-A)

———— NASA SPACECRAFT. (S-A)

———— PUTTING SATELLITES TO WORK. (S-A)

———— SPACE: THE NEW FRONTIER. 1966. (U-S-A)

B. Communications Satellites

Communications Satellite Corporation. NEW COMMUNICATIONS ERA. (U-S-A)

Jaffe, Leonard. COMMUNICATIONS IN SPACE. 1966. (S)

Lukashok, Alvin. COMMUNICATIONS SATELLITES: HOW THEY WORK. 1967. (I-U-S)

Pierce, John R. THE BEGINNINGS OF SATELLITE COMMUNICATIONS. 1968. (S-A)

Smithsonian Institution. COMMUNICATIONS IN SPACE. (U-S-A)

TRW Systems Group. INTELSAT III WALL CHART. (U-S-A)

U. S. National Aeronautics and Space Administration. PROJECT RELAY. (S-A)

———— SIGNIFICANT ACHIEVEMENTS IN SPACE COMMUNICATIONS AND NAVIGATION, 1958–64. 1966. (A)

C. Lunar Probes

Jet Propulsion Laboratory. RANGER. (S-A)

———— SURVEYOR. Soft-Landing Lunar Spacecraft. (S-A)

McCauley, John F. MOON PROBES. 1969. (I-U-S)

National Geographic Society. MACHINES GIVE MEN RUNNING START IN LEAP TO THE MOON. Volume 46, No. 25, March 18, 1968. (I-U)

———— MOONCRAFT INSPIRES SPACE AGE STUDENT. Volume 46, No. 29, April 29, 1968. (I-U-S)

U. S. National Aeronautics and Space Administration. LUNAR ORBITER. (I-U-S-A)

———— SURVEYOR. (I-U-S-A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

D. Meteorological Satellites

Barrett, Eric C. VIEWING WEATHER FROM SPACE. 1967. (A)

Hubert, Lester F. and Paul E. Lehr. WEATHER SATELLITES. 1967. (S-A)

U. S. National Aeronautics and Space Administration. SIGNIFICANT ACHIEVEMENTS IN SATELLITE METEOROLOGY, 1958–64. 1966. (A)

Widger, William K., Jr. METEOROLOGICAL SATELLITES. 1966. (S)

E. Planetary Probes

Jet Propulsion Laboratory. MARINER-MARS. (S-A)

_____ MARINER VI AND VII—MARS 1969. (S-A)

U. S. National Aeronautics and Space Administration. MARINER-MARS 1964, FINAL PROJECT REPORT. 1968. (S-A)

_____ MARINER SPACECRAFT. (S-A)

_____ A REPORT FROM MARINER IV. (U-S-A)

_____ REPORT FROM MARS. (U-S-A)

F. Scientific Satellites

Dobson, G. M. B. EXPLORING THE ATMOSPHERE. 1969. (A)

Corliss, William R. SCIENTIFIC SATELLITES. 1967. (S-A)

Hawk Model Company. VANGUARD SATELLITE. (I-U-S)

_____ EXPLORER 18. (I-U-S-)

King-Hele, Desmond. THE SHAPE OF THE EARTH. (S-A)

U. S. National Aeronautics and Space Administration. EXPLORER XXIX (THE GEODETIC EXPLORER). (S-A)

_____ ORBITING GEOPHYSICAL LABORATORY. (U-S-A)

_____ ORBITING SOLAR OBSERVATORY. (U-S-A)

_____ PEGASUS. (U-S-A)

_____ PIONEER. (S-A)

7. Manned Exploration of Space

Books and materials in this section deal with man in space. They discuss such subjects as Projects Mercury, Gemini, and Apollo; manned Soviet space flights; astronaut training; equipment for the Apollo spacecraft; protection against the physical and psychological hazards of space travel; colonization of the Moon; orbiting space stations; and future manned exploration of the planets. Models of Mercury, Gemini, and Apollo spacecraft are also listed.

A. General Information

Conroy, Charles W. and Harold E. Mehrens. THE DAWNING SPACE AGE. 1963. (S-A)

Denoyer-Geppert Company. SPACE TRAVEL. (U)

Faget, Max. MANNED SPACE FLIGHT. 1965. (S)

Hynek, Allen. EXPLORING THE UNIVERSE. 1968. (U-S)

Krieger, S. J. SPACE PROGRAMS OF THE SOVIET UNION. 1967. (S-A)

Olney, Ross. AMERICANS IN SPACE. 1969. (U-S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

Sheldon, Charles S. II. REVIEW OF THE SOVIET SPACE PROGRAM: With Comparative United States Data. 1968. (S-A)

Shelton, William R. AMERICAN SPACE EXPLORATION: The First Decade. 1967. (S-A)

Silverberg, Robert. THE WORLD OF SPACE. (U.S.)

Society for Visual Education. COUNTDOWN TO SPLASHDOWN. (I-U-S)

Times Mirror School and Library Service. STUDY PRINTS. (I-U-S)

U. S. House of Representatives. Committee on Science and Astronautics. REVIEW OF THE SOVIET SPACE PROGRAM WITH COMPARATIVE UNITED STATES DATA. 1967. (A)

U. S. National Aeronautics and Space Administration. SPACE THE NEW FRONTIER. 1966. (U-S-A)

B. Projects Mercury and Gemini

Feravolo, Rocco V. AROUND THE WORLD IN NINETY MINUTES: JOURNEY OF TWO ASTRONAUTS. 1968. (P)

Grissom, Virgil I. GEMINI: The Personal Story of America's Martyr Astronaut. 1968. (U-S-A)

Gurney, Gene. WALK IN SPACE: The Story of Project Gemini. 1967. (U-S)

Keen, Martin. THE WONDERS OF SPACE 1967. (I-U)

Revell, Inc. GEMINI ASTRONAUT MODEL. (I-U-S)

———— GEMINI SPACE CAPSULE. (I-U-S)

———— MERCURY CAPSULE WITH REDSTONE BOOSTER. (U-S)

Revell Educational Systems. PICTURE SET. (P-I-U-S)

U. S. National Aeronautics and Space Administration. COUNTDOWN. Elementary: General Science. (I-U)

———— MAN IN SPACE. (U-S-A)

———— MANNED SPACE FLIGHT (Mercury and Gemini). (U-S-A)

———— NASA FACTS ORGANIZATION SERIES. #0-6 NASA John F. Kennedy Space Center (S-A)

C. Apollo Program

Barbour, John, FOOTPRINTS ON THE MOON. 1969. (U-S-A)

Bergaust, Erik. MURDER ON PAD 34. 1968. (A)

Booker, Peter, Gerald Frewer and Geoffrey Pardoe. PROJECT APOLLO: THE WAY TO THE MOON. 1969. (S-A)

Butler, S. T. and H. Messel. APOLLO AND THE UNIVERSE. 1968. (S)

Cooper, Henry S. F., Jr. APOLLO ON THE MOON. 1969. (S-A)

Haggerty, James J. APOLLO: LUNAR LANDING. 1969. (U-S)

Honeywell. APOLLO. Stabilization and Control. (S-A)

National Aerospace Education Council. PROJECT APOLLO. (I-U-S)

National Geographic Society. Volume 47, No. 30, May 5, 1969. (I-U)

Pope, Billy N. and Ramona W. Emmons. LET'S VISIT A SPACESHIP. 1968. (P-I)

Revell, Inc. APOLLO LUNAR MODULE MODEL KIT. (I-U-S)

———— APOLLO LUNAR SPACECRAFT MODEL KIT. (I-U-S)

———— APOLLO SPACECRAFT MODEL KIT. (I-U-S)

Scholastic Magazines. THE PLAN TO SEND OUR MEN TO THE MOON—PROJECT APOLLO. (P)

———— PROJECT APOLLO—THE WAY TO THE MOON. (I)

Society for Visual Education. BUILDING TOWARD THE MOON. (I-U-S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

U. S. National Aeronautics and Space Administration. APOLLO 8. MAN AROUND THE MOON. (U-S-A)

_____ APOLLO 11: PRELIMINARY SCIENCE REPORT. (A)

_____ CODE NAME: SPIDER, FLIGHT OF APOLLO 9. (U-S-A)

_____ "IN THIS DECADE . . ." MISSION TO THE MOON. (U-S-A)

_____ JOURNEY TO THE MOON. (P-I-U-S-A)

_____ LOG OF APOLLO 11. (I-U-S-A)

_____ MANNED SPACE FLIGHT (APOLLO). (U-S-A)

_____ MISSION REPORT/APOLLO 10. (U-S-A)

_____ NASA ASTRONAUTS. 1968. (P-I-U-S)

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_____ PICTURE SET 2, "Men of Apollo." (P-I-U-S-A)

_____ PICTURE SET 4, "First Manned Lunar Landing." (P-I-U-S-A)

_____ PICTURE SET 5, "Man on the Moon." (P-I-U-S-A)

Wilfred, John N. WE REACH THE MOON. 1969. (U-S-A)

D. Sustaining Man in Space

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Gargarin, Yuri and V. Lebedev. SURVIVAL IN SPACE. 1969. (S-A)

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Burgess, Eric. VOYAGE TO THE PLANETS. 1968. (S-A)

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8. Space Science

Books and materials in this section deal with those scientific fields that are most closely related to the exploration of space, such as astronomy, biology, and physics. They survey the Sun, Moon, planets, stars, optical and radio telescopes, and other astronomical tools, astrophotography, planetariums, the solar wind, the ionosphere, cosmic rays, celestial mechanics, the effects of space environment on man's body and mind, living in space, life support systems, weightlessness, the possibility of extraterrestrial life, and many other scientific facts and theories arising from the exploration of space.

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Field Enterprises Educational Corporation. EXPLORING SPACE. (A)

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Haber, Heinz. SPACE SCIENCE: A New Look at the Universe. 1967. (S-A)

Hynek, Allen. EXPLORING THE UNIVERSE. 1968. (U-S)

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Abetti, Giorgio. THE EXPLORATION OF THE UNIVERSE. 1968. (A)

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Bergamini, David. UNIVERSE. 1968. (I-U)

Corliss, William R. SCIENTIFIC SATELLITES. 1967. (S-A)

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———— SIGNIFICANT ACHIEVEMENTS IN SPACE ASTRONOMY, 1958-64. 1966. (A)

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———— SPACE RESOURCES FOR TEACHERS: SPACE SCIENCE. 1969. (A)

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(2) Astronomical Tools

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Branley, Franklyn M. EXPERIMENTS IN SKY WATCHING. 1967. (U-S)

Brown, Sam. ALL ABOUT TELESCOPES. 1967. (U-S-A)

Calvert, H. R. ASTRONOMY. 1967. (S-A)

Denoyer-Geppert Company. ASTRONOMERS AT WORK. (U)

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———— TELESCOPES YOU CAN BUILD. (S)

———— TIME IN ASTRONOMY. (S)

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———— STUDENT PROJECT PLANETARIUM. (U-S)

Keene, George T. STAR GAZING WITH TELESCOPE AND CAMERA. 1967. (S)

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Pickering, James S. WINDOWS TO SPACE. 1967. (S-A)

U. S. National Aeronautics and Space Administration. THE PLANETARIUM. (A)

(3) The Planets, Sun, and Solar System

Adler Planetarium. PLANETARY DATA. (U-S-A)

———— SCALE MODELS OF THE SOLAR SYSTEM. (U-S-A)

American Map Company. SOLAR SYSTEM. (I-U-S)

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Edmund Scientific Company. SOLAR PLANET DISPLAY. (I-U-S)

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Glasstone, Samuel. THE BOOK OF MARS. 1968. (S-A)

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———— EXPLORATION OF SPACE. (I)

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———— SPACESCAPES KIT. (I)

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Koenig, L. R. HANDBOOK OF THE PHYSICAL PROPERTIES OF THE PLANET VENUS. 1967. (S-A)

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———— MARINER-MARS 1964, FINAL PROJECT REPORT. 1968. (S-A)

———— MARINER SPACECRAFT. (S-A)

———— A REPORT FROM MARINER IV. (U-S-A)

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———— SIGNIFICANT ACHIEVEMENTS IN PLANETARY ATMOSPHERES, 1958-64. 1966. (A)

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Whipple, Fred L. EARTH, MOON, AND PLANETS. 1968. (A)

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Cram Company, George F. THE MOON AND OUTER SPACE. (U-S)

———— MOON GLOBE. (I-U-S)

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Edmund Scientific Company. MOON MAP. (U-S-A)

———— MOON MURALS. (U-S)

Garelick, May. LOOK AT THE MOON. 1969. (P)

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———— SCIENCE FICTION COMES TO LIFE IN LUNAR LAB. Volume 47, No. 6, October 14, 1968. (I-U)

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Slote, Alfred. MOON IN FACT AND FANCY. 1967. (I-U)

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———— and Alvin Maurer. CONQUEST OF THE MOON. 1969. (I-U)

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(5) The Stars, Comets, and Meteors

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———— STARS OF SUMMER. (U-S)

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———— SIGNIFICANT ACHIEVEMENTS IN SPACE BIOSCIENCE, 1958-64. (A)

———— SPACE RESOURCES FOR TEACHERS: BIOLOGY. 1969. (A)

(2) Living in Space

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———— FOOD FOR SPACE FLIGHT. (P-I-U-S-A)

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———— WEIGHTLESSNESS. Jr. High School: Physics. (U-S)

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———— ORBITS AND REVOLUTIONS. High School: Physics. (S)

———— SHAPES OF TOMORROW. 1967. (A)

———— WHAT'S UP THERE, A Source Book in Space Oriented Mathematics for Grades 5-8. Student and Teacher editions. (I-U), (A)

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Craig, Richard A. THE EDGE OF SPACE: EXPLORING THE UPPER ATMOSPHERE. 1968. (S)

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Sutton, Richard M. THE PHYSICS OF SPACE. 1965. (S)

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Valens, E. G. THE ATTRACTIVE UNIVERSE. 1969. (S-A)

9. Benefits and Impacts Resulting from the Space Program

The books and materials in this section survey the numerous kinds of benefits already derived and expected from the space program, and discuss the impacts, both current and future, that society will experience as a result of space exploration.

A. Benefits

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———— CIVILIAN PUBLIC PROBLEMS AND THE AEROSPACE INDUSTRY. 1967. (A)

Gilmer, J. R., and others. COMMERCIAL UTILIZATION OF SPACE. 1968. (S-A)

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U. S. National Council on Marine Resources and Engineering Development. UNITED STATES ACTIVITIES IN SPACECRAFT OCEANOGRAPHY. 1967. (S-A)

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Bayce, Arthur E. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. 1968. (A)

Bernardo, James V. AVIATION AND SPACE IN THE MODERN WORLD. 1968. (S-A)

Bloomfield, Lincoln, editor. OUTER SPACE. Prospects for Man and Society. 1968. (A)

Bubb, Mary, Walter H. Mathews, and others. WHERE DO WE GO FROM THE MOON? 1967. (S-A)

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Eckman, Philip K. TECHNOLOGY AND SOCIAL PROGRESS—SYNERGISM OR CONFLICT? 1968. (S-A)

Goodwin, Harold L. THE IMAGES OF SPACE. 1965. (S)

Hough, Roger W. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. 1968. (A)

———— *Gail L. Knudtson, and Shirley Thomas.* SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. (A)

Hubbard, Earl. THE SEARCH IS ON. 1969. (U-S)

Hult, J. L. SATELLITES AND TECHNOLOGY FOR COMMUNICATIONS: SHAPING THE FUTURE. 1968. (S-A)

Kash, Don E. THE POLITICS OF SPACE COOPERATION. 1967. (S-A)

Kennan, Erlend A. and Edmund H. Harvey, Jr. MISSION TO THE MOON. 1969. (A)

Konecci, Eugene, and others. SPACE AGE IN FISCAL YEAR 2001. 1967. (S-A)

Levitt, I. M. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. 1968. (A)

———— *John Baird, and others.* SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. 1968. (A)

Miernyk, William H., and others. IMPACT OF THE SPACE PROGRAM ON A LOCAL ECONOMY. 1967. (A)

Pluimer, Harold P. THE FRONTIERS OF OUR TIME. 1968. (S-A)

Prehoda, R. W. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. 1968. (A)

U.S. Atomic Energy Commission. SOVIET SPACE PROGRAMS, 1962–1965; Goals and Purposes, Achievements, Plans, and International Implications. 1967 (S-A)

U.S. House of Representatives. Committee on Science and Astronautics. A SUMMARY of the results of 449 responses to a space program questionnaire

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

sent by Representative Olin E. Teague to the 750 top industrial firms listed by *Fortune*. (A)

University of Denver. EFFECTS OF A NATIONAL SPACE PROGRAM ON UNIVERSITIES. 1968. (A)

C. Space Law

Fawcett, J. E. S. INTERNATIONAL LAW AND THE USES OF OUTER SPACE. 1968. (A)

Gal, Guyala. SPACE LAW. 1969. (A)

Morenoff, Jerome. WORLD PEACE THROUGH SPACE LAW. 1967. (A)

U. S. Senate. Committee on Foreign Relations. TREATY ON OUTER SPACE. (U-S)

Vlasic, Ivan A. EXPLORATION IN AEROSPACE LAW. Selected Essays by John Cobb Cooper, 1946–1966. 1968. (A)

Yale Reports. NO WAR IN SPACE: THE MOON TREATY AND AFTER. May 1967. (S-A)

10. History and Biography

The books and materials in this section present the history of space exploration and rocketry, and also profiles and biographies of astronauts, scientists, and engineers who have made significant contributions to the development of space travel, both in past centuries and today.

A. History

Bergaust, Erik. THE RUSSIANS IN SPACE. 1969. (U-S)

Dolezal, Erich. CONQUEST OF SPACE. 1969. (U-S)

Emme, Eugene M. A HISTORY OF SPACE FLIGHT. 1965. (S)

Executive Office of the President. U. S. AERONAUTICS AND SPACE ACTIVITIES, 1968. 1969. (S-A)

Hirsch, S. Carl. ON COURSE. Navigating in Sea, Air, and Space. 1967. (I-U)

Keen, Martin. THE WONDERS OF SPACE: ROCKETS, MISSILES, AND SPACECRAFT. 1967. (I-U)

Kepler, Johann. KEPLER'S SOMNIUM: THE DREAM, OR POSTHUMOUS WORK ON LUNAR ASTRONOMY. 1967. (S-A)

Ley, Willy. EVENTS IN SPACE. 1969. (S)

Malina, Frank J. THE ROCKET PIONEERS. (S-A)

National Geographic Society. MAN'S CONQUEST OF SPACE. 1968. (S-A)

Ronan, Colin A. ASTRONOMERS ROYAL. 1967. (S-A)

Shelton, William R. SOVIET SPACE EXPLORATION: THE FIRST DECADE. 1968. (A)

Smithsonian Institution. MASTERS OF SPACE. (I-U-S)

U. S. National Aeronautics and Space Administration. FIFTY YEARS OF AERONAUTICAL RESEARCH. 1968. (S-A)

———— SEMIANNUAL REPORTS TO CONGRESS, 16th through 19th, July 1966-June 1968. (A)

———— SPACE: THE NEW FRONTIER. 1966. (U-S-A)

B. Biography

Akens, David S. JOHN GLENN. First American in Orbit. 1969. (U-S)

Chrysler, C. Donald and Donald L. Chaffee. ON COURSE TO THE STARS. 1968. (U-S-A)

Cox, Donald. AMERICA'S EXPLORERS OF SPACE. 1969. (S-A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

Crawford, Deborah. THE KING'S ASTRONOMER. 1968. (U)

David, Heather. WERNHER VON BRAUN. 1967. (U-S)

Goodrum, John. WERNHER VON BRAUN, Space Pioneer. 1969. (U-S)

Halacy, D. S. THEY GAVE THEIR NAMES TO SCIENCE. 1967. (U-S)

Karman, Theodore von with Lee Edson. THE WIND AND BEYOND. 1967. (S-A)

Land, Barbara. THE TELESCOPE MAKERS. From Galileo to the Space Age. 1968. (U-S)

National Aerospace Education Council. ROBERT GODDARD: "FATHER" OF MODERN ROCKETRY. (U-S-A)

_____ ROBERT H. GODDARD PORTFOLIO No. 1. (I-U-S-A)

Pickering, James S. FAMOUS ASTRONOMERS. 1968. (U-S)

Richey, B. J. APOLLO ASTRONAUTS. First Men to the Moon. 1969. (U-S)

Ronan, Colin A. EDMOND HALLEY. 1969. (S-A)

Rule, Leonard. SPACE. 1967. (U-S)

Sharpe, Mitchell R. YURI GAGARIN. First Man in Space. 1969. (U-S)

Silverberg, Robert. FOUR MEN WHO CHANGED THE UNIVERSE. 1968. (U-S)

Tharp, Edgar. GIANTS OF SPACE. 1968. (I-U)

Thomas, Shirley. MEN OF SPACE. 1968. (S-A)

11. Career Opportunities in the Space Program

Books and materials in this section provide information about the many careers that are involved in the nation's space program. They range from books giving general information about career fields, to leaflets offering details about specific jobs in the crafts and in engineering, scientific, and technical occupations.

A. General Information About Career Fields

Chronicle Guidance. ATOMIC ENERGY, CAREERS IN. (S)

_____ CAREER GUIDANCE AND PLANNING HELP A PERSON ACHIEVE A SUCCESSFUL CAREER. (S)

_____ ELECTRONICS MANUFACTURING INDUSTRY WORKERS. (S)

_____ INFORMATION FOR HIGH SCHOOL STUDENTS AND VOCATIONAL GUIDANCE COUNSELORS CONCERNING THE BROAD FIELD OF GEOPHYSICS. (S)

_____ THE MEN BEHIND THE MAN IN THE MOON. (S)

_____ NASA COUNSELS THE EARTHBOUND. (S)

National Science Foundation. SUMMER SCIENCE TRAINING PROGRAMS FOR HIGH-ABILITY SECONDARY SCHOOL STUDENTS. (S)

Science Research Associates. AEROSPACE INDUSTRIES MANUFACTURING WORKERS. (S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

———— JOBS IN SCIENCE. (S)

U. S. Department of Labor. EMPLOYMENT OUTLOOK FOR AIRCRAFT, MISSILES AND SPACECRAFT MANUFACTURING OCCUPATIONS. (U-S-A)

U. S. National Aeronautics and Space Administration. LEARNING ABOUT SPACE CAREERS. (I-U)

———— *NASA:* TWENTIETH CENTURY EXPLORER . . . into the Sea of Space. (S-A)

———— SEVEN STEPS TO A CAREER IN SPACE SCIENCE AND TECHNOLOGY. (S)

———— SPACE JOBS. (P)

Zarem, Lewis. CAREERS AND OPPORTUNITIES IN ASTRONAUTICS. 1969. (S-A)

B. Craftsmen

Careers, Inc. ASSEMBLERS, ELECTRONICS MANUFACTURING. (S)

———— INSTRUMENT REPAIRMAN. (S)

Chronicle Guidance. INSTRUMENT MAKER. (S)

Science Research Associates. JOBS IN MECHANICAL WORK. (S)

C. Engineers

American Institute of Aeronautics and Astronautics. YOUR CAREER AS AN AERO/SPACE ENGINEER. (S)

American Society for Engineering Education. THE ROAD TO GRADUATE SCHOOL IN ENGINEERING. (A)

Amstead, B. H. and Wilbourn McNutt. ENGINEERING AS A CAREER TODAY. 1967. (S)

Careers, Inc. AEROSPACE ENGINEER. (S)

———— ATOMIC ENERGY ENGINEERS AND SCIENTISTS. (S)

———— CERAMIC ENGINEER. (S)

———— CHEMICAL ENGINEER. (S)

———— ELECTRICAL ENGINEER. (S)

———— ENGINEERS, GENERAL. (S)

———— MECHANICAL ENGINEER. (S)

———— METALLURGICAL ENGINEER. (S)

Chronicle Guidance. CERAMIC ENGINEER. (S)

———— THE CERAMIC ENGINEER. (S)

———— CHEMICAL ENGINEER. (S)

———— ELECTRICAL ENGINEER. (S)

———— ENGINEERS. (S)

———— MECHANICAL ENGINEER. (S)

———— METALLURGICAL ENGINEER. (S)

———— NUCLEAR ENGINEER. (S)

———— WANTED: ELECTRONICS ENGINEERS. (S)

Junior Engineering Technical Society. THE JETS PROGRAM. (S)

National Society of Professional Engineers. ENGINEERING—A CAREER OF OPPORTUNITY. (U-S)

Neal, Harry Edward. ENGINEERS UNLIMITED: Your Career in Engineering. 1968. (U-S)

Science Research Associates. AEROSPACE ENGINEERS. (S)

———— ELECTRICAL ENGINEERS. (S)

———— JOBS IN ENGINEERING. (S)

———— MECHANICAL ENGINEERS. (S)

Splaver, Sarah. SOME DAY I'LL BE AN AEROSPACE ENGINEER. (I-U)

U. S. Department of Labor. EMPLOYMENT OUTLOOK FOR ENGINEERS: AEROSPACE, AGRICULTURAL, CERAMIC, CHEMICAL, CIVIL, ELECTRICAL, INDUSTRIAL, MECHANICAL, METALLURGICAL, MINING. (S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

D. Mathematicians

Careers, Inc. MATHEMATICIAN. (S)

Chronicle Guidance. MATHEMATICIAN. (S)

Mathematical Association of America. GUIDEBOOK TO DEPARTMENTS IN THE MATHEMATICAL SCIENCES IN THE UNITED STATES AND CANADA. 1968. (S)

———— PROFESSIONAL OPPORTUNITIES IN MATHEMATICS. 1967. (S)

———— YOU'LL NEED MATH. (U-S)

Science Research Associates. JOBS IN MATHEMATICS. (S)

U. S. Department of Labor. EMPLOYMENT OUTLOOK FOR MATHEMATICS AND RELATED FIELDS: MATHEMATICIANS, STATISTICIANS, ACTUARIES. (S)

E. Scientists

American Astronomical Society. A CAREER IN ASTRONOMY. (U-S)

Careers, Inc. ASTRONOMER. (S)

———— BIOPHYSICIST. (S)

———— HEALTH PHYSICIST. (S)

———— MICROBIOLOGIST. (S)

———— PHYSICAL SCIENTISTS. (S)

———— PHYSICIST. (S)

Chronicle Guidance. ASTRONOMER. (S)

———— BIOCHEMIST. (S)

———— CHEMIST. (S)

———— GEOLOGIST. (S)

———— GEOPHYSICIST. (S)

———— HEALTH PHYSICIST. (S)

———— METEOROLOGIST. (S)

———— PHYSICIST. (S)

Science Research Associates. ASTRONOMERS. (S)

U. S. Department of Commerce. Environmental Sciences Services Administration. EMPLOYMENT OPPORTUNITIES IN DYNAMIC METEOROLOGY AND APPLIED MATHEMATICS. (S-A)

U. S. Department of Labor. EMPLOYMENT OUTLOOK FOR BIOLOGICAL SCIENTISTS. (S)

———— EMPLOYMENT OUTLOOK FOR EARTH SCIENTISTS: GEOLOGISTS, GEOPHYSICISTS, METEOROLOGISTS, OCEANOGRAPHERS. (S)

———— EMPLOYMENT OUTLOOK FOR PHYSICAL SCIENTISTS: CHEMISTS, PHYSICISTS, ASTRONOMERS. (S)

F. Technicians

American Society for Engineering Education. ENGINEERING EDUCATION. (S-A)

———— THE ENGINEERING TECHNICIAN. (S-A)

Barnett, Leo and Lou Ellen Davis. CAREERS IN COMPUTER PROGRAMMING. 1967. (S)

Brooking, Walter J. ENGINEERING TECHNICIANS. 1969. (U-S)

Careers, Inc. ATOMIC ENERGY TECHNICIANS. (S)

———— CHEMICAL LABORATORY TECHNICIAN. (S)

———— DATA PROCESSING MANAGER. (S)

———— ELECTRICAL ENGINEERING TECHNICIAN. (S)

———— ELECTRONIC COMPUTER OPERATING PERSONNEL. (S)

———— ENGINEERING TECHNICIAN. (S)

———— INSTRUMENTATION TECHNICIAN. (S)

———— MECHANICAL ENGINEERING TECHNICIAN. (S)

———— PROGRAMMER. (S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

———— RADIATION MONITOR. (S)

———— RESEARCH AND DEVELOPMENT TECHNICIANS. (S)

———— SCIENCE AND ENGINEERING TECHNICIANS. (S)

———— SYSTEMS ANALYSTS (Data Processing Systems). (S)

———— TECHNICAL ILLUSTRATOR. (S)

———— TECHNICAL WRITER. (S)

Chronicle Guidance. A CAREER AS A LABORATORY TECHICIAN. (S)

———— CHEMICAL TECHNICIANS. What They Do and How They Learn to Do It. (S)

———— THE CRITICAL NEED FOR TRAINED TECHNICIANS. (S)

———— DRAFTSMAN, MECHANICAL. (S)

———— ELECTRICAL TECHNICIAN. (S)

———— ELECTRONIC TECHNICIAN. (S)

———— HEALTH PHYSICS TECHNICIAN. (S)

———— MATHEMATICAL TECHNICIAN. (S)

———— MECHNICAL TECHNICIAN. (S)

———— METEOROLOGICAL TECHNICIAN. (S)

———— A MILLION AND A HALF TECHNICIANS NEEDED BY 1975. (S)

———— PROGRAMMER. (S)

———— TECHNICIANS. (S)

Englebardt, Stanley L. CAREERS IN DATA PROCESSING. 1969. (U-S)

Science Research Associates. AEROSPACE TECHNICIANS. (S)

———— CHEMICAL TECHNICIANS. (S)

———— DATA-PROCESSING MACHINE OPERATORS. (S)

———— DRAFTSMEN. (S)

———— JOBS IN ELECTRONIC DATA PROCESSING. (S)

———— JOBS IN TECHNICAL WORK. (S)

———— PROGRAMMERS. (S)

———— SYSTEMS ANALYSTS. (S)

———— TECHNICAL WRITERS. (S)

Seligsohn, I. J. YOUR CAREER IN COMPUTER PROGRAMMING. 1967. (S)

U. S. Department of Labor. EMPLOYMENT OUTLOOK FOR ELECTRONIC COMPUTER OPERATING PERSONNEL, PROGRAMMERS. (S)

———— EMPLOYMENT OUTLOOK FOR TECHNICAL WRITERS. (S)

———— EMPLOYMENT OUTLOOK FOR TECHNICIANS: ENGINEERING AND SCIENCE TECHNICIANS, DRAFTSMEN. (S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

12. The Space Program of the U. S. S. R.

Books and materials in this section discuss the accomplishments of the Soviet space program and compare it with its U. S. counterpart. They also offer information about the Russian cosmonauts and leading scientists and engineers.

Bergaust, Erik. THE RUSSIANS IN SPACE. 1969. (U-S)

Krieger, S. J. SPACE PROGRAMS OF THE SOVIET UNION. 1967. (S-A)

Sharpe, Mitchell R. YURI GAGARIN. First Man In Space. 1969. (U-S)

Sheldon, Charles S. II. REVIEW OF THE SOVIET SPACE PROGRAM, With Comparative United States Data. 1968. (S-A)

Shelton, William R. SOVIET SPACE EXPLORATION: THE FIRST DECADE. 1968. (A)

U. S. Atomic Energy Commission. SOVIET SPACE PROGRAMS, 1962–1965; Goals and Purposes, Achievements, Plans, and International Implications. 1967. (S-A)

U. S. House of Representatives. Committee on Science and Astronautics. REVIEW OF THE SOVIET SPACE PROGRAM WITH COMPARATIVE UNITED STATES DATA. 1967. (A)

13. Aeronautical Research

The books and materials in this section deal with areas of aeronautical research in which NASA is presently involved. These include such subjects as the supersonic transport (SST), V/STOL aircraft, the sonic boom, and aircraft engine noise.

Baird, John and Virginia F. Holley. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. 1968. (A)

Blackall, T. E. CONCORDE. THE STORY, THE FACTS AND THE FIGURES. 1969. (S-A)

Committee on SST Sonic Boom. REPORT ON GENERATION AND PROPAGATION OF SONIC BOOM. 1967. (A)

_____ REPORT ON HUMAN RESPONSE TO THE SONIC BOOM. 1968. (A)

_____ REPORT ON PHYSICAL EFFECTS OF THE SONIC BOOM. 1968. (A)

Dwiggins, Don. THE SST. Here it comes, ready or not. 1968. (S-A)

Herron, Edward A. COBRA IN THE SKY. The Supersonic Transport. 1968. (U-S-A)

Jones, R. J. and others. METEOROLOGICAL PROBLEMS IN THE DESIGN AND OPERATION OF SUPERSONIC AIRCRAFT. 1967. (S-A)

Monogram Models, Inc. BOEING SST SUPERSONIC TRANSPORT. (U-S)

Revell, Inc. X-15 ROCKET PLANE model kit. (I-U-S)

Schwartz, Ira R. SECOND CONFERENCE ON SONIC BOOM RESEARCH. 1968. (A)

Seebass, A. R. SONIC BOOM RESEARCH. 1968. (S-A)

Sparks, James C. WINGED ROCKETRY. 1968. (U-S)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

U. S. House of Representatives. Committee on Science and Astronautics. AERONAUTICAL RESEARCH AND DEVELOPMENT. (A)

U. S. National Aeronautics and Space Administration. LIFTING BODIES. (S-A)

———— PAVEMENT GROOVING AND TRACTION STUDIES. 1969. (A)

———— PROGRESS OF NASA RESEARCH RELATING TO NOISE ALLEVIATION OF LARGE SUBSONIC JET AIRCRAFT. 1968. (A)

14. Other

Lewis, Claudia. POEMS OF EARTH AND SPACE. 1967. (I-U)

Valens, E. G. CYBERNAUT. A SPACE POEM. 1968. (U-S)

Wright, Hamilton, Helen Wright, and Samuel Rapport. TO THE MOON: A Distillation of Great Writings from Ancient Legend to Space Exploration. 1968. (A)

15. Curriculum Resource Materials and Aids to Teachers

Books and materials in this section provide space education resources for teachers in most all curricular areas and at all grade levels. Included are curriculum guides, units, handbooks, manuals to help organize student projects, brochures describing various kinds of assistance available from professional organizations, suggestions for supplementing classroom instruction, source books, educational packets, catalogs of education materials, list of special NASA aids for teachers, teaching tips, and many other kinds of helpful information.

Caspers, Wesley. AEROSPACE ARITHMETIC. (A)

Centuri Engineering Company. EDUCATIONAL PACKET (Ed Pack). (A)

———— EDUCATORS GUIDE TO MODEL ROCKETRY. 1968. (A)

Civil Air Patrol. AEROSPACE EDUCATION. (A)

———— AEROSPACE EDUCATION COURSE. (A)

———— AEROSPACE EDUCATION PROJECTS. A Planning Guide. (A)

———— CATALOG OF AEROSPACE EDUCATION AND TRAINING MATERIALS. (A)

Communications Satellite Corporation. NEW COMMUNICATIONS ERA—Secondary School Implementation Booklet. (A)

Continental Press. IT'S YOUR WORLD—Space. (I-U)

———— IT'S YOUR WORLD—Transportation. (I-U)

Department of Public Instruction, Commonwealth of Pennsylvania. EARTH AND SPACE GUIDE FOR ELEMENTARY TEACHERS. (A)

Editors of Science Experimenter. JUNIOR SCIENCE PROJECTS. 1967. (U-S)

Engelbrektson, Sune and Peter Greenleaf. LET'S EXPLORE OUTER SPACE. 1969. (S-A)

Estes Industries. EDUCATIONAL PACKET (Ed Pack). (A)

Field Enterprises Educational Corporation. EXPLORING SPACE. (A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

Goran, Morris. EXPERIMENTAL ASTRONAUTICS. 1967. (S-A)

Marshall, Jane N. SOURCES OF PICTURES, PAMPHLETS AND PACKETS. 1967. (A)

McIntyre, Kenneth M. SPACE SCIENCE EDUCATIONAL MEDIA RESOURCES. A Guide for Junior High School Teachers. 1966. (A)

National Aerospace Education Council. INVITATION TO MEMBERSHIP IN THE NATIONAL AEROSPACE EDUCATION COUNCIL. (A)

_____ SUGGESTIONS FOR COMMEMORATING GODDARD DAY—March 16. (A)

National Geographic Society. A LIST OF ASTRONOMY articles appearing in issues of the *National Geographic Magazine* from November 1932 through May 1969. (U-S-A)

_____ A LIST OF SPACE TRAVEL articles appearing in issues of the *National Geographic Magazine* from December 1926 through May 1969. (U-S-A)

National Science Teachers Association. A UNIVERSE TO EXPLORE. A Space Sciences Source Book for Junior High School Teachers. 1969. (A)

Packard, John W. and Hiram R. Haggett. AEROSPACE CURRICULUM RESOURCE GUIDE. 1968. (A)

Perkins, Otho. EARTH AND SPACE SCIENCE SKILL-CARDS. (U-S)

Porter, T. R. TEACHING TIPS FROM TST. Earth-Space Science. 1967. (A)

Rocket Research Institute, Inc. THE ROCKET RESEARCH INSTITUTE, INC., ITS PROGRAMS AND POLICIES. (A)

Ross, David. SPACE CLUB MANUAL. 1969. (A)

Sawyer, Roger W. and Robert A. Farmer. NEW IDEAS FOR SCIENCE FAIR PROJECTS. 1967. (I-U-S)

Smith, S. W. A HANDBOOK OF ASTRONAUTICS. 1969. (S)

Society for Visual Education. GEOGRAPHY FROM SPACE. (I-U-S)

Strickler, Mervin K., Jr. AN INTRODUCTION TO AEROSPACE EDUCATION. 1968. (A)

Teachers Publishing Corporation. SPACE. (A)

U. S. Department of Health, Education, and Welfare. AIDS FOR MATHEMATICS EDUCATION: SPACE-ORIENTED MATHEMATICS FOR EARLY ELEMENTARY GRADES. (A)

U. S. National Aeronautics and Space Administration. EDUCATIONAL PUBLICATIONS. (P-I-U-S-A)

_____ FROM HERE, WHERE? A SPACE MATHEMATICS SUPPLEMENT FOR SECONDARY LEVELS. 1965. (A)

_____ INTRODUCING CHILDREN TO SPACE. THE LINCOLN PLAN. 1966. (A)

_____ LIFE SCIENCE IN A SPACE AGE SETTING. (A)

_____ MODEL SPACECRAFT CONSTRUCTION. UNITS FOR SECONDARY SCHOOL INDUSTRIAL ARTS. 1966. (A)

_____ NASA FILM LIST. (I-U-S-A)

_____ THE PLANETARIUM. (A)

_____ SHAPES OF TOMORROW. 1967. (A)

_____ SPACE RESOURCES FOR TEACHERS: BIOLOGY. 1969. (A)

_____ SPACE RESOURCES FOR TEACHERS: SPACE SCIENCE. 1969. (A)

_____ SPACE RESOURCES FOR THE HIGH SCHOOL. *Industrial Arts Resources Units.* 1967. (A)

_____ WHAT'S UP THERE, A Source Book in Space Oriented Mathematics for Grades 5-8. Student and Teacher editions. (I-U) and (A)

Vermillion, Charles A. WEATHER SATELLITE PICTURE RECEIVING STATIONS. 1969. (S-A)

CODE: (P) primary—grades 1–3; (I) intermediate—grades 4–6; (U) upper elementary—grades 7–8; (S) secondary—grades 9–12; (A) college and adult.

annotated bibliography

part-II

PART II - ANNOTATED BIBLIOGRAPHY

Abetti, Giorgio. THE EXPLORATION OF THE UNIVERSE. American Elsevier, 288 p., 1968. $9.50. Discusses the exploration of the Moon, solar activity, the present knowledge of planets and comets, and radio astronomy. Also gives general reader background information for understanding the results of astronomical observations. (A)

Abraham, L. H. SPACE TECHNOLOGY. Volume 1. Spacecraft Systems. #NAS 1.21:65. Supt. of Documents, 85 p., 1965. 35 cents. A basic text for upper-level college engineering students. Discusses the method of planning spacecraft and relating and utilizing various subsystems. Shows how to establish relationships of various parts and the utilization of various subsystems before designs are committed. 35 cents. (A)

AC Electronics. FLY ME TO THE MOON. AC Electronics. An illustrated booklet including reprints of articles from *The Milwaukee Journal* in which a science writer provides an insight into the work of AC Electronics workers who are producing guidance systems for manned Apollo flights to the Moon. Free. (U-S-A)

_____GUIDING MEN TO THE MOON. AC Electronics. An illustrated pamphlet explaining the Apollo flight to the Moon, the AC guidance and navigation system, and the importance of product reliability in space. Free. (S-A)

_____INERTIAL GUIDANCE IN THE SPACE AGE. AC Electronics. An illustrated pamphlet explaining inertial guidance. Free. (S-A)

Adams, James L. SPACE TECHNOLOGY. Volume 2. Spacecraft Mechanical Engineering. #NAS 1.21:66. Supt. of Documents, 116 p., illus., 1965. 60 cents. A basic text for upper-level college engineering students. Discusses structural, temperature-control, and electronic-packaging methods and related basic theory. (A)

Adams, P. J. THE MOON: Its Geology and Geography. Her Majesty's Stationery Office, 36 p., illus., 1968. Available from the British Information Services. Paperback, 50 cents. A review of facts, observations, and hypotheses concerning the Moon. Much of the information originated from U.S spacecraft. (S-A)

Adler Planetarium. THE BRIGHTEST STARS AND THEIR COMPANIONS. Adler Planetarium. Information sheet giving brightness, distance, diameter, spectral class, etc. 5 cents. (U-S-A)

_____PLANETARY DATA. Adler Planetarium. An information sheet giving density, mass, period of rotation, surface temperatures, and other facts about the planets. 5 cents. (U-S-A)

_____SCALE MODELS OF THE SOLAR SYSTEM. Adler Planetarium. An information sheet listing planet sizes and distances from the Sun. Converts these figures to two scales in which the diameter of the Moon is ¼" and the orbit of Mercury is 1". These conversions result in concepts of size and distance that are familiar to the student. 5 cents. (U-S-A)

_____STARS OF SUMMER. Adler Planetarium. Booklet discussing major summer constellations and including simple star maps. 15 cents. (U-S)

_____STARS OF WINTER. Adler Planetarium. Booklet discussing major winter constellations and including simple star maps. 20 cents. (U-S)

Aerojet General Corporation. SPACELINES . . . an examination of America's activities in space. Aerojet General Corporation. An 8-page illustrated publication reviewing the nation's space programs and technologies, and some of the effects they have had on our everyday lives. Includes a discussion of current and future chemical and nuclear rocket propulsion. Free. (U-S-A)

Aerospace Corporation. SPACE PRIMER. Aerospace Corporation. An illustrated pamphlet outlining the principles of rocketry and discussing types of rockets, thrust, launch vehicles, and orbiting. Also includes brief career information. Free. (U-S)

Ahrendt, Myrl H. THE MATHEMATICS OF SPACE EXPLORATION. Holt, 160 p., illus., 1965. Paperback, $1.96. Discusses some of the mathematics involved in space exploration, and the laws of celestial mechanics. Includes problems for students to solve. (S)

Akens, David S. JOHN GLENN. First American in Orbit. Strode, 128 p., illus., 1969. $3.95. The first book in a series of space bibliographies entitled "Heroes of Space." (U-S)

Alter, Dinsmore, Clarence H. Cleminshaw, and John G. Phillips. PICTORIAL ASTRONOMY. Crowell, 328

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

p., illus., rev. 1969. $10. A complete survey, updated to cover the discovery of pulsars and quasars and new data on the nature of the planets. Discusses the Sun, Moon, comets and meteors, and space science. (S-A)

American Association of Variable Star Observers. MANUAL FOR ASTRONOMICAL PHOTOELECTRIC PHOTOMETRY, with supplement. American Association of Variable Star Observers. Discusses need for amateur involvement, required apparatus, observing procedures, data reduction, and other related topics. $1. (S-A)

American Astronomical Society. A CAREER IN ASTRONOMY. American Astronomical Society. A 16-page brochure giving brief information on the nature of the work, the academic training required, and the opportunities available in a professional career in astronomy. Single copy free. (U-S)

American Education Publications. STAR ATLAS AND WORKBOOK OF THE HEAVENS. American Education Publications. A 32-page illustrated booklet with star charts and star finding activities for the amateur beginning astronomer. 30 cents (U-S) (See also Editors of American Education Publications.)

American Institute of Aeronautics and Astronautics. BUILDING YOUR OWN ROCKET? American Institute of Aeronautics and Astronautics. A brochure emphasizing the hazards of amateur rocketry and urging amateur rocketeers to use only model rockets approved by the National Association of Rocketry, or acquire qualified adult supervision for experimentation. Free. (U-S-A)

_____YOUR CAREER AS AN AERO/SPACE ENGINEER. American Institute of Aeronautics and Astronautics. Discusses the responsibilities and rewards of a career as an aerospace engineer, the aerospace industry, various jobs within the profession, and secondary school and college courses. Also includes a list of engineering schools accredited by the Engineers Council for Professional Development. *Single copy only.* Free. (S)

American Map Company. SOLAR SYSTEM. #9572. American Map Company. A chart, 34" x 45", with large photographs of the planets and the Moon. Also includes a map of the Moon, phases of the Moon, and data about the solar system—relative diameters of the planets, distances from the Sun, and other facts. 49 cents. Minimum order $5, unless order is prepaid, including postage. (I-U-S)

_____WORLD STAR CHART. #9574. American Map Company. A chart, 28" x 42", that shows the stars of both hemispheres, and aids in locating stars from any position on Earth at any time of the year. 49 cents. Minimum order $5, unless order is prepaid, including postage. (U-S-A)

American Meteorite Laboratory. METEORITE CRATER STUDY KIT. American Meteorite Laboratory. Includes a labeled Canyon Diablo meteorite fragment of the nickel-iron meteorite which formed the Arizona meteorite crater; a sample of Metallic Spheroids with description; a sample of country rock transformed by and impregnated with the exploding meteorite; and a 65-page booklet—*A Comet Strikes the Earth*—enclosing a sample of oxidized meteorite and containing basic information about meteorites. $1.25. (S-A)

American Society for Engineering Education. ENGINEERING EDUCATION. American Society for Engineering Education. The November 1966 issue is devoted to the engineering technician. Discusses the work of the engineering technician, his place on the engineering team, certification, curriculum, academic requirements, and many other subjects of interest to young people seeking information about this career field. $1.25. (S-A)

_____THE ENGINEERING TECHNICIAN. American Society for Engineering Education. A 21-page illustrated booklet discussing the work of the engineering technician, his place on the engineering team, qualifications, salary, opportunities, and the various technician specialties in engineering fields. 50 cents. (S-A)

_____THE ROAD TO GRADUATE SCHOOL IN ENGINEERING. American Society for Engineering Education. A booklet discussing the value of graduate work in engineering, graduate degrees, necessary aptitudes, how and where to apply for financial assistance, opportunities for graduate study, etc. 50 cents. (A)

Amstead, B. H. and Wilbourn McNutt. ENGINEERING AS A CAREER TODAY. Dodd-Mead, 207 p., illus., 1967. $3.75. A report on engineering as a career. Describes engineering in general, what an engineering college is like, kinds of work that an engineer does, how to choose the right college of engineering, rewards of the profession and outlook for the future. Also gives details about the work of chemical, civil, mechanical, and electrical engineers and a brief overview of aerospace engineering. The book concludes with three appendices: Accredited Colleges of Engineering in the United States, Code of Ethics for Engineers, and Engineering Societies in America. (S)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

Anderson, Poul. THE INFINITE VOYAGE. Crowell-Collier, 144 p., illus., 1969. $4.95. A brief history of astronomy, an explanation of the principles of rocketry, and a review of man's acomplishments in space to date. Based on these facts, the author then speculates on the future of man in space, discussing such subjects as manned orbiting laboratories, Moon colonies, and interplanetary travel. The possibility of extraterrestrial life is examined. (U-S-A)

Asimov, Isaac. THE ABC's OF SPACE. Walker, 48 p., illus., 1969. $3.95. For each capital and each small letter of the alphabet, the author provides two definitions of space terminology, such as *Apollo* and *astronaut* for A, and *Lunar Module* and *lift-off* for L. (P)

_____THE DOUBLE PLANET. Abelard, 159 p., illus., rev. 1967. $4. Discoveries about the Earth and the Moon derived from Russian and American lunar probes and earth satellites. (I-U)

_____MARS. Follett, 32 p., illus., 1967. $1. Information about Mars for the young reader. (P-I)

_____STARS. Follett, 32 p., illus., 1968. $1. Astronomy for the young reader, with color photographs, vocabulary lists, and "Things to Do." (P-I)

Atomic Energy Commission, see U.S. Atomic Energy Commission.

Austin, L.G. FUEL CELLS. #NAS 1.21:120. Supt. of Documents, 439 p., illus., 1967. Paperback, $2.75. A guide to the past and future of fuel-cell technology. Research in many areas is discussed, and construction and manufacturing techniques are covered as are theories and various potential uses of fuel cells. Semi-technical. (S-A)

Baird, John and Virginia F. Holley. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. #2: Impacts Upon Aviation and Aeronautics. Stanford Research Institute *Aerospace Systems Series,* Volume 2. 38 p., 1968. Available from The Clearing House, #N68-34314. $3. Microfiche, 65 cents. Reports on NASA's aeronautical research program, pointing out that significant developments are not given the publicity they deserve. Shows that direct benefits are easily identified within a short time after their application, which has led to the superior technical and competitive position of U.S. aeronautical equipment. Also discusses opportunities for training hard core unemployed for jobs stemming from new aeronautical technology. (A)

Barbour, John. FOOTPRINTS ON THE MOON. Associated Press, 224 p., illus., 1969. $5. A documentary book tracing the U.S. manned space program from its beginning in the early 1960's through the Moon landing and return of Apollo 11. (U-S-A)

Barnett, Leo and Lou Ellen Davis. CAREERS IN COMPUTER PROGRAMMING. Walck, 117 p., illus., 1967. $4.50. Shows how computers are used in a variety of human activities, including air traffic control, airline reservations, space trajectories and orbits, solution of engineering problems, etc. Gives the history of computers, explains how they work, and discusses programmers and systems analysts careers preparation and working conditions. (S)

Barrett, Eric C. VIEWING WEATHER FROM SPACE. Praeger, 160 p., illus., 1967. $6. Discusses the important role of weather satellites in weather research and forecasting, and also examines the most likely future developments in meteorology resulting from their continued use. (A)

Barrowman, James. CALCULATING THE CENTER OF PRESSURE OF A MODEL ROCKET. #TIR-33. Centuri, 36 p., illus., 1968. Paperback, $1. Explains how to calculate and locate the exact center-of-pressure to achieve maximum performance with an adequate margin of stability in model rockets. Includes all necessary equations, design tips, sample problems and easy-to-use graphs that eliminate most of the arithmetic steps. (U-S-A)

_____STABILITY OF A MODEL ROCKET IN FLIGHT. #TIR-30. Centuri, 16 p., illus., 1968. Paperback, 50 cents. Presents more than 40 illustrations to assist in explaining the basic principles of model rocket stability. Shows how amount of stability can be adjusted to improve altitude performance, and demonstrates tests for determining the stability of a rocket. Answers many questions regarding model rocket stability. (U-S-A)

Bauer, Raymond A., Richard S. Rosenbloom and Laure Sharpe. SECOND ORDER CONSEQUENCES. M. I. T. Press, 240 p., 1969. $12.50. A study of the unanticipated major social effects of expanding technology, of which the space program is a prime example. The authors examine these effects, some of which are beneficial, and others, undesirable. They suggest how the consequences of technological change can be managed for the good of all. An in-depth treatment of the impact of the space program on the role of technicians is provided. This book is one of a three-volume series prepared by the American Academy of Arts and Sciences and sponsored by NASA. (S-A)

Bayce, Arthur E. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. #4: Impacts of New Materials Technology. Stanford Research Institute *Aerospace Systems Series*, Volume 4. 63 p., 1968. Available from The Clearing House, #N68-34388. $3. Microfiche, 65 cents. Shows how new materials stemming from space-oriented research have benefited health care, communications, transportation, and power generation. Considers fuel cells, electroforming, nickel-cadmium batteries, titanium alloys, etc. (A)

Beiser, Germaine. THE STORY OF GRAVITY. Dutton, 190 p., illus., 1968. $5.95. Discussion of the everyday phenomena caused by gravity. The author traces the development of ideas about gravity, and presents some of the questions about it yet to be answered. An ending chapter gives all the mathematics necessary to understand this book. (U-S)

Bell System. SIGNALS IN SPACE. Bell Telephone Company. An illustrated booklet describing the role of the Bell System in our nation's space program. Free. (S-A)

Bergamini, David. UNIVERSE. Young Readers edition. Silver Burdett, 128 p., illus., 1968. $4.95. An introduction to astronomy, exploring the birth and eventual death of the solar system and man's effort to conquer space. (I-U)

Bergaust, Erik. MARS. PLANET FOR CONQUEST. Putnam, 95 p., illus., 1967. $3.29. A review of the knowledge of Mars gathered through telescopic studies and the Mariner spacecraft fly-by photographs. Also discusses future plans for the exploration of Mars through spacecraft. (I-U-S)

_____MURDER ON PAD 34. Putnam, 253 p., illus., 1968. $5.95. A frank report on the U.S. space program with emphasis on the disastrous Apollo fire and NASA safety policies. (A)

_____THE RUSSIANS IN SPACE. Putnam, 96 p., illus., 1969. $3.29. A review of Soviet accomplishments in space and the background of those accomplishments, beginning with their use of German scientists and engineers and equipment at the close of World War II. A detailed log of Russian space vehicles through October 4, 1967 is included. (U-S)

Berman, Louis. AMERICAN ROCKETRY. Classroom Library Series. Rand McNally, 61 p., illus., 1967. Paperback, $1. Discusses rocket principles and design, how rockets are launched, guided, and controlled, how space data is collected, orbiting the Earth, and peaceful uses of outer space. Includes a glossary. (U-S)

Bernardo, James V. AVIATION AND SPACE IN THE MODERN WORLD. Dutton, 383 p., illus., rev. 1968. $7.95. A comprehensive survey of flight in the atmosphere and in space, and its social, economic, and political impacts. Discusses principles of flight and historical events. Sections related to space flight have been expanded in this revised edition. (S-A)

Black, R. P. and C. W. Foreman. THE AEROSPACE ENGINEER AND SOCIAL OVERHEAD SYSTEMS. #AD-600 084. Clearing House, 18 p., 1967. $3. Discusses the possibility of the aerospace engineer applying his skills to the solution of large-scale public problems. (S-A)

_____CIVILIAN PUBLIC PROBLEMS AND THE AEROSPACE INDUSTRY. #AD-600 086. Clearing House, 17 p., 1967. $3. Discusses the possibility that the aerospace industry could apply its capabilities to the solution of civilian public problems. The report examines the systems approach as it has been used by the aerospace industry, and its possible future use in civilian public areas. Included is a discussion of what an industry move into civilian public areas would imply in relation to the transferability of industry scientists and engineers. (A)

Blackall, T. E. CONCORDE. THE STORY, THE FACTS, AND THE FIGURES. Foulis, 108 p., illus., 1969. Available from John W. Caler Publications. $8.50. The story of the Anglo-French supersonic transport—the *Concorde,* from conception of design to the rollout of the prototype. Examines the airframe, systems, controls, avionics, engines, and other components. Also discusses the competitive American and Russian supersonic transport (SST) designs, and the economic and performance phases of the Concorde. Semi-technical. (S-A)

Bloomfield, Lincoln, editor. OUTER SPACE. Prospects for Man and Society. Praeger, 284 p., illus., rev. 1968. $6.50. A collection of articles on the effects of space exploration on mankind. (A)

Booker, Peter, Gerald Frewer and Geoffrey Pardoe. PROJECT APOLLO: THE WAY TO THE MOON. American Elsevier, 208 p., illus., 1969. $5.50. A story of America's efforts to place men on the Moon, including the Mercury and Gemini programs, first steps toward a lunar landing. Discusses the rocket vehicles, launch equipment, Command, Service and Lunar Modules, astronaut training, and the technical problems, setbacks, and final assault on the Moon. (S-A)

Branley, Franklyn M. A BOOK OF MARS FOR YOU. Crowell, 58 p., illus., 1968. $3.95. Facts about

Mars for the young reader. Includes references to Mariner spacecraft. (P)

_____A BOOK OF VENUS FOR YOU. Crowell, 58 p., illus., 1969. $4.50. A presentation for the young reader of data about the planet Venus, including the latest information gathered by today's space probes. (I)

_____EXPERIMENTS IN SKY WATCHING. Crowell, 111 p., illus., rev. 1967. $4.50. Directions for locating major heavenly bodies, including many helpful facts such as the positions of the planets by months through 1976. Also discusses the Moon, planets, the Sun, stars, and comets, and their movements. Includes directions for making simple devices to aid in sky watching. (U-S)

Braun, Wernher von. SPACE FRONTIER. Holt, 216 p., illus., 1967. $4.95. A 1969 revised edition is available in paper covers from Fawcett, 95 cents. The Director of NASA's Marshall Space Flight Center explains the complex nature of flight in space, and discusses such topics as launch and ascent, flight through space, safety in space, space stations, flights to the Moon, and the possibility of manned flight to the planets and the stars. (S-A)

Brite, Robert J. and Carolo H. Fioranelli. SYNCHROS AND SERVOS. Sams, 192 p., illus., 1967. $4.95. Discusses fundamentals of devices that convert electrical impulses into mechanical motion, and their application to target tracking and acquisition, radar antennae positioning, moving of heavy loads, etc. A programmed text approach. Semi-technical. (A)

Brooking, Walter J., editor. ENGINEERING TECHNICIANS. Ferguson, 380 p., illus., 1969. $8.95. Describes the job of the engineering technician and his contributions to the engineering field. Discusses educational opportunities, what to expect on the first job, personal and educational requirements, advancement possibilities, licenses or certification, earnings and benefits, outlook for the future, and many other details associated with the career of engineering technician. The aerospace engineering technician is included. (U-S)

Brown, Sam. ALL ABOUT TELESCOPES. Edmund Scientific, 192 p., illus., 1967. Paperback, $3. A complete guide for teachers and students for making and using telescopes. Simplified text and clear hand-drawn illustrations enable the reader to proceed step-by-step to build various kinds of telescopes for immediate use. (U-S-A)

Bruce, Lois. SPACE ABC. Bobbs-Merrill, 64 p., illus., 1967. $4. Twenty-six space words and terms are illustrated and defined for the young reader who already knows his alphabet. (I-U)

Bubb, Mary, Walter H. Mathews, and Others. WHERE DO WE GO FROM THE MOON? Fairchild Publications, Inc., 181 p., illus., 1967. Paperback, $3.95. Six reporters, specialists in aerospace news, present significant views and facts, drawn from many official sources, which have an important bearing on the far-reaching decision as to what America should do about continuing the space program. Discusses the U. S. space program through 1985, examining national pride, defense, training, competition with the Soviets, aerospace technology, and the economic impact of the program upon the nation. (S-A)

Burgess, Eric, editor. VOYAGE TO THE PLANETS. Volume 16, Science and Technology series. American Astronautical Society, 171 p., illus., 1968. $9.75. A report on a symposium held March 1967 featuring outstanding space scientists who discussed past and future interplanetary space travel, both unmanned and manned. (S-A)

Butler, S. T. and H. Messel, editors. APOLLO AND THE UNIVERSE. Pergamon, 430 p., 1968. $7. Paperback, $5.50. Selected lectures on the U.S. manned space flight program and certain fields of modern physics and cosmology presented under the auspices of the University of Sydney (Australia) for summer science high school students. (S)

Calvert, H. R. ASTRONOMY. Her Majesty's Stationery Office, 50 p., illus., 1967. Available from the British Information Services. Paperback, $1.20. A booklet depicting models of globes, orreries, armillaries, etc., on display at the Science Museum, London. Photographs are in color, and the text gives brief historical accounts of the development and use of the instruments over the past centuries. Of interest to those who want to know how astronomers of the past studied the movements of the planets around the Sun. (S-A)

Careers, Inc. AEROSPACE ENGINEER. #103B. Careers, Inc. Career brief. 35 cents. (S)

_____ASSEMBLERS, ELECTRONICS MANUFACTURING. #B140. Careers, Inc. Career brief. 35 cents. (S)

_____ASTRONOMER. #99S. Careers, Inc. Career summary. 20 cents. (S)

_____ATOMIC ENERGY ENGINEERS AND SCIENTISTS. #153B. Careers, Inc. Career brief. 35 cents. (S)

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_____ATOMIC ENERGY TECHNICIANS. #331S. Careers, Inc. Career summary. 20 cents. (S)

_____BIOPHYSICIST. #298S. Careers, Inc. Career summary. 20 cents. (S)

_____CERAMIC ENGINEER. #22S. Careers, Inc. Career summary. 20 cents. (S)

_____CHEMICAL ENGINEER. #136S. Careers, Inc. Career summary. 20 cents. (S)

_____CHEMICAL LABORATORY TECHNICIAN. #32S. Careers, Inc. Career summary. 20 cents. (S)

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_____ELECTRICAL ENGINEER. #112S. Careers, Inc. Career summary. 20 cents. (S)

_____ELECTRICAL ENGINEERING TECHNICIAN. #224S. Careers, Inc. Career summary. 20 cents. (S)

_____ELECTRONIC COMPUTER OPERATING PERSONNEL. #168B. Careers, Inc. Career brief. 35 cents. (S)

_____ENGINEERING TECHNICIAN. #168S. Careers, Inc. Career summary. 20 cents. (S)

_____ENGINEERS, GENERAL. #108B. Careers, Inc. Career brief. 35 cents. (S)

_____HEALTH PHYSICIST. #74B. Careers, Inc. Career brief. 35 cents. (S)

_____INSTRUMENTATION TECHNICIAN. #85S. Careers, Inc. Career summary. 20 cents. (S)

_____INSTRUMENT REPAIRMAN. #102B. Careers, Inc. Career brief. 35 cents. (S)

_____MATHEMATICIAN. #21B. Careers, Inc. Career brief. 35 cents. (S)

_____MECHANICAL ENGINEER. #171S. Careers, Inc. Career summary. 20 cents. (S)

_____MECHANICAL ENGINEERING TECHNICIAN. #207S. Careers, Inc. Career summary. 20 cents. (S)

_____METALLURGICAL ENGINEER. #334S. Careers, Inc. Career summary. 20 cents. (S)

_____MICROBIOLOGIST. #189S. Careers, Inc. Career summary. 20 cents. (S)

_____PHYSICAL SCIENTISTS. #171B. Careers, Inc. Career brief. 35 cents. (S)

_____PHYSICIST. #15B. Careers, Inc. Career brief. 35 cents. (S)

_____PROGRAMMER. #144B. Careers, Inc. Career brief. 35 cents. (S)

_____RADIATION MONITOR. #228S. Careers, Inc. Career summary. 20 cents. (S)

_____RESEARCH AND DEVELOPMENT TECHNICIANS. #316S. Careers, Inc. Career summary. 20 cents. (S)

_____SCIENCE AND ENGINEERING TECHNICIANS. #B149. Careers, Inc. Career brief. 35 cents. (S)

_____SYSTEMS ANALYSTS (Data Processing Systems). #98S. Careers, Inc. Career summary. 20 cents. (S)

_____TECHNICAL ILLUSTRATOR. #260S. Careers, Inc. Career summary. 20 cents. (S)

_____TECHNICAL WRITER. #30B. Careers, Inc. Career brief. 35 cents. (S)

Carey, David. THE ROCKET. Wills and Hepworth, Ltd., 52 p., illus., 1967. Available from Merry Thoughts, 75 cents. A book in the "How it works" series published in England. Gives details for young readers about the principles of rocketry and their application to space travel. (I-U)

Caspers, Wesley. AEROSPACE ARITHMETIC. National Aerospace Education Council. Sample problems showing how children's interest in aviation and space flight may be used to develop arithmetic skills. For grades 1 through 6. 16 p., 25 cents. (A)

Centuri Engineering Company. CENTURI MODEL ROCKET PRODUCTS CATALOG. Centuri Engineering Company. Information about model rockets, kits, accessories, books, rocket engines, tracking devices, and finishing materials, emphasizing experimentation in design, launching, tracking, and instrumentation. Catalog is 25 cents, which is credited against an initial order. (S-A)

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_____EDUCATIONAL PACKET (Ed Pack). Centuri Engineering Company. A packet of literature explaining model rocketry and its role in developing space concepts. Packet contains an Educator's Guide; current catalog, current copy of *American Rocketeer,* materials demonstrating the motivational benefits of a model rocketry curriculum unit, etc. Packet is free to teachers, youth organization leaders, or counselors, church groups, and other adults or organizations working with young people. Requests should be submitted on institutional or official stationery. Additional Educational Packets may be purchased at $1 each. (A)

_____EDUCATORS GUIDE TO MODEL ROCKETRY. Centuri Engineering Company, 59 p., illus., 1968. Paperback, $1. Presents material and ideas designed to introduce the teacher or adult leader of youth groups to the basic concepts of model rocketry. Gives suggestions as to how to get started in model rocketry. (A)

_____STUDENT'S GUIDE TO MODEL ROCKETRY. #TB-10. Centuri Engineering Company. 60 p., illus., 1969. Paperback, $1.75. An introduction to model rocketry, and the application of rocketry to the standard disciplines. Using photographs, diagrams, graphs and drawings, the Guide explains how to get started in model rocketry and how to conduct rocketry research projects. Includes engine data charts and Model Rocketry Examination. (U-S-A)

Chronicle Guidance. ASTRONOMER. #210. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____ATOMIC ENERGY, CAREERS IN. #384. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____BIOCHEMIST. #132. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____A CAREER AS A LABORATORY TECHNICIAN. #R33. Chronicle Guidance. A 4-page reprint discussing the importance and emphasizing the personal qualifications. 35 cents. (S)

_____CAREER GUIDANCE AND PLANNING HELP A PERSON ACHIEVE A SUCCESSFUL CAREER. #R15. Chronicle Guidance. A 4-page reprint from *Chemical and Engineering News,* March 1966, discussing career planning in chemistry and chemical engineering fields. 35 cents. (S)

_____THE CERAMIC ENGINEER. #R167. Chronicle Guidance. A 2-page article reprinted from the American Ceramic Society Bulletin, November 1968, discussing the ceramic engineering career. 35 cents. (S)

_____CERAMIC ENGINEER. #161. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____CHEMICAL ENGINEER. #160. Chronicle Guidance. A 4-page occupational brief giving a general view of this occupational field. Discusses work performed, working conditions, salaries, personal and educational requirements, and employment outlook. 35 cents. (S)

_____CHEMICAL TECHNICIANS. What They Do and How They Learn to Do It. #R27. Chronicle Guidance. A reprint from the *American Vocational Journal,* April 1964. 35 cents. (S)

_____CHEMIST. #153. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____THE CRITICAL NEED FOR TRAINED TECHNICIANS. #R164. Chronicle Guidance. A 3-page article reprinted from the June 1968 issue of *Technical Education News.* 35 cents. (S)

_____DRAFTSMAN, MECHANICAL. #224. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____ELECTRICAL ENGINEER. #158. Chronicle Guidance. A 4-page occupational brief discussing the work of an electrical engineer, personal and educational backgrounds required, training opportunities, the place of women in this engineering field, and outlook for this occupation. 35 cents. (S)

_____ELECTRICAL TECHNICIAN. #204. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____ELECTRONICS MANUFACTURING INDUSTRY WORKERS. #57. Chronicle Guidance. An 8-page occupational brief. 50 cents. (S)

_____ELECTRONIC TECHNICIAN. #166. Chronicle Guidance. A 4-page occupational brief discussing the work performed, working conditions, earnings, requirements, training for the job, future outlook, etc. 35 cents. (S)

_____ENGINEERS. #151. Chronicle Guidance. An 8-page occupational brief. 50 cents. (S)

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_____GEOLOGIST. #129. Chronicle Guidance. An 8-page occupational brief. 50 cents. (S)

_____GEOPHYSICIST. #148. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____HEALTH PHYSICIST. #185. Chronicle Guidance. A 4-page occupational brief dealing with a scientific occupation related to radiation safety. 35 cents. (S)

_____HEALTH PHYSICS TECHNICIAN. #186. Chronicle Guidance. A 4-page occupational brief discussing a career related to radiation safety. 35 cents. (S)

_____INFORMATION FOR HIGH SCHOOL STUDENTS AND VOCATIONAL GUIDANCE COUNSELORS CONCERNING THE BROAD FIELD OF GEOPHYSICS. # R31. Chronicle Guidance. A 6-page article discussing geodesy, seismology, meteorology, geomagnetism, and aeronomy, plus geochemistry, the planetary sciences, and other geophysic specialties. 50 cents. (S)

_____INSTRUMENT MAKER. #194. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____MATHEMATICAL TECHNICIAN. #421. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____MATHEMATICIAN. #162. Chronicle Guidance. A 4-page occupational brief describing the various kinds of jobs open to the mathematician, qualifications, earnings, opportunities for advancement, women as mathematicians, and expectations for future employment in this professional field. 35 cents. (S)

_____MECHANICAL ENGINEER. #326. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____MECHANICAL TECHNICIAN. #103. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____THE MEN BEHIND THE MAN IN THE MOON. #R137. Chronicle Guidance. A reprint from the *Occupational Outlook Quarterly* discussing job opportunities with the National Aeronautics and Space Administration for scientists, engineers, technicians, and craftsmen. 35 cents. (S)

_____METALLURGICAL ENGINEER. #62. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____METEOROLOGICAL TECHNICIAN. #422. Chronicle Guidance. A 4-page brief giving details of this occupation. 35 cents. (S)

_____METEOROLOGIST. #143. Chronicle Guidance. A 4-page brief discussing the work of a meteorologist, working conditions, benefits, training, and future outlook. 35 cents. (S)

_____A MILLION AND A HALF TECHNICIANS NEEDED BY 1975. #R6. Chronicle Guidance. A reprint from the *Occupational Outlook Quarterly* outlining some of the findings of a Bureau of Labor Statistics study. 35 cents. (S)

_____NASA COUNSELS THE EARTHBOUND. #R138. Chronicle Guidance. A reprint from the *Occupational Outlook Quarterly* discussing the career materials and counseling service that NASA offers to schools and colleges. 50 cents. (S)

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_____TECHNICIANS. #229. Chronicle Guidance. A 4-page occupational brief. 35 cents. (S)

_____WANTED: ELECTRONICS ENGINEERS. #R9. Chronicle Guidance. A reprint from *Electronics* Magazine discussing the many opportunities for electronics engineers. 35 cents. (S)

Chrysler, C. Donald and Donald L. Chaffee. ON COURSE TO THE STARS. Kregel Publications, 155 p., illus., 1968. $3.95. The life story of Roger B. Chaffee, NASA astronaut and astronautical pioneer, who gave his life to the U. S. space program, as told by his family and friends. (U-S-A)

Civil Air Patrol. AEROSPACE EDUCATION. Civil Air Patrol. Booklet interpreting aerospace education. Tells why schools are interested, points out effects of aerospace progress, and explains the responsibility for aerospace education, how it may be presented in a school, and its relationship to modern curriculum trends. Free. (A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

_____AEROSPACE EDUCATION COURSE. Curriculum Outline, college level. Civil Air Patrol. A curriculum outline developed in response to requests from colleges and universities interested in offering a course in aerospace education. Free. (A)

_____AEROSPACE EDUCATION PROJECTS. A Planning Guide. Civil Air Patrol. A 20-page booklet of use to those who need guidance in setting up formal aerospace education programs for teacher education—workshops, institutes, and symposia. Gives suggestions for organization, procedures, and a sample schedule. Also provides a list of sources of assistance. Free. (A)

_____CATALOG OF AEROSPACE EDUCATION AND TRAINING MATERIALS. Civil Air Patrol. Describes the inexpensive aerospace education and training materials available from Civil Air Patrol. Includes textbooklets, student workbooks, instructor guides, filmstrips, recordings, programmed instruction exercises, and self-study guides. Free. (A)

_____CELESTIAL MECHANICS, A PROGRAMMED LEARNING EXERCISE. Civil Air Patrol. 18 p. Explains motion in space, gravity, orbits, orbital velocity, escape velocity, and celestial motion. Describes the behavior of satellites and space vehicles. Free. (S-A)

_____ROCKET AND MISSILE IDENTIFICATION: A PROGRAMMED LEARNING EXERCISE. Civil Air Patrol. Illustrations teach identification of representative rockets and missiles. Includes self-examination, scoring key and rocket and missile project. 25 cents. (U-S-A)

Civil Service Commission, see U. S. Civil Service Commission.

Clarke, Arthur C., editor. THE COMING OF THE SPACE AGE: Famous Accounts of Man's Probing of the Universe. Meredith, 301 p., 1967. $6.95. A collection of 36 articles ranging from a *New York Times* editorial to first-hand accounts of historic space events. Also includes eminent scientists' writings on space and astronomy subjects, philosophies, analyses, and other interesting pieces selected and edited by the author. (S-A)

_____MAN AND SPACE. Time, Inc., 200 p., illus., rev. 1968. Available to schools and libraries through Silver Burdett Company. $3.95. A review of the history of man's interest in space and an analysis of the technological developments that have enabled man to explore this new frontier. Also discusses the future of space travel to the Moon and beyond and the changes that may occur on Earth as a consequence of experiments in space. Includes both textual material and picture essays. (U-S-A)

_____THE PROMISE OF SPACE. Harper, 325 p., illus., 1968. $8.95. Projections for the future in space, based on the history of the development of space exploration. Discusses the cultural impacts of space exploration on world politics, philosophies, and economics. (S-A)

Commerce, Department of, see U. S. Department of Commerce

Committee on SST Sonic Boom. REPORT ON GENERATION AND PROPAGATION OF SONIC BOOM. National Academy of Sciences, National Research Council, 27 p., 1967. $2. A summary of sonic boom research in government, industry, and in the universities. Also assesses the adequacy of such work in the light of the current state of knowledge. (A)

_____REPORT ON HUMAN RESPONSE TO THE SONIC BOOM. National Academy of Sciences; National Research Council, 12 p., 1968. $2. A report on research on how sonic booms affect people, both physically and psychologically. Also suggests supersonic transport (SST) design criteria that might possibly lead to the construction of an SST whose sonic booms would be of an acceptable nature. (A)

_____REPORT ON PHYSICAL EFFECTS OF THE SONIC BOOM. National Academy of Sciences; National Research Council, 13 p., 1968. $2. An examination of the "structural" response of materials to sonic booms and suggestions for further research. Stresses the need for simulators in sonic boom research and examines the effects of sonic booms on glass, masonry, adhesives, and other building materials, as well as on earth structures. (A)

Communications Satellite Corporation. NEW COMMUNICATIONS ERA. Communications Satellite Corporation. An illustrated booklet giving the story of the change in world-wide communications that has begun as a result of communications satellites. Free. (U-S-A)

_____NEW COMMUNICATIONS ERA—Secondary School Implementation Booklet. Communications Satellite Corporation. For use with booklet, "New Communications Era" and/or with a filmstrip of the same title. A supplemental

teaching aid for use in science, mathematics, and in social studies such as business, history, and government. Gives suggestions as to how communications satellites might be considered in each of these curriculum areas. Free. For the teacher. (A)

Conroy, Charles W. and Harold E. Mehrens. THE DAWNING SPACE AGE. Civil Air Patrol. 1963. An illustrated 248-page book outlining the history of rocketry and providing basic information about rocket engines, guidance, space research and space flight. $1.50. (S-A)

Continental Press. IT'S YOUR WORLD—Space. Continental Press. A reading enrichment program consisting of student reading selections with workbooks, activities to stimulate creativity, and a vocabulary and comprehension testing program. Includes materials for five students and a teacher's unit with sample student materials and pre-printed carbon masters for liquid duplication of test materials and record-keeping forms. Reading selections relate to weather and communications satellites, space probes, Project Apollo, and meteoroids, asteroids, and comets. One of ten similar units on various subjects, parts of which also include space subjects. $8.75 per unit. (I-U)

_____IT'S YOUR WORLD — Transportation. Continental Press. A reading enrichment program consisting of student reading selections with workbooks, activities to stimulate creativity, and a vocabulary and comprehension testing program. Includes materials for five students and a teacher's unit with sample student materials and pre-printed carbon masters for liquid duplication of test materials and record-keeping forms. Reading selections relate to V/STOL aircraft, the SST, the C5 Air Force transport, plus underwater research craft. One of ten similar units on various subjects. $8.75 per unit. (I-U)

Coombs, Charles. SPACETRACK. Watchdog of the Skies. Morrow, 128 p., illus., 1969. $3.75. A description of an Air Force organization called "Spacetrack" which keeps tab on all objects in space. Includes discussions of Spacetrack headquarters inside Cheyenne Mountain near Colorado Springs, and the far-flung radar posts that are part of the "watchdog" system. Tells how the total system works. (I-U-S)

Cooper, Henry S. F., Jr. APOLLO ON THE MOON. Dial, 144 p., 1969. $4.50. Discusses a manned lunar landing, including the tasks of the astronauts while on the Moon, their physical reaction to the lunar environment, the Moon "samples" brought to Earth, and the precautionary measures against contamination from "alien organisms" on the Moon. (S-A)

Corliss, William R. SCIENTIFIC SATELLITES. #NAS 1.21:133. Supt. of Documents, 822 p., illus., 1967. Paperback, $3. A comprehensive study of unmanned scientific satellites, covering the period from the first Sputnik in 1957 through 1966. Discusses missions and spacecraft and scientific instruments carried by the spacecraft. Designs, experiments, capabilities, and orbits are recorded. Semi-technical. (S-A)

_____and Edwin G. Johnsen. TELEOPERATOR CONTROLS. #N69-21478. Clearing House, 162 p., illus., 1968. $3. A survey of control technology and its possible effects on new products and processes. Discusses the interaction between man and machines in oceanology and space exploration. Semi-technical. (A)

Cox, Donald. AMERICA'S EXPLORERS OF SPACE. Hammond, 96 p., illus., rev. 1969. $3.50. Profiles of 16 heroes of space, describing their contributions to the American space program. Includes information on Goddard, von Braun, and Pickering in research and development; astronauts Shepard, Glenn, and White; and engineers Kraft and Parks. Also gives a chronology of U.S. manned space flights through Apollo 11. (S-A)

Craig, Richard A. THE EDGE OF SPACE: EXPLORING THE UPPER ATMOSPHERE. Doubleday, 150 p., illus., 1968. Paperback, $1.25. Discusses the exploration of the upper atmosphere by balloons, satellites, rockets, etc., and tells what has been learned about sunspots, the aurora borealis and their effects on communications and space flight. (S)

Cram Company, George F. THE MOON AND OUTER SPACE. George F. Cram Company. A 20-page illustrated booklet giving basic facts about the Moon and noting data gathered by the Surveyor spacecraft. Also discusses the benefits of space exploration and prospects for exploring the planets. Provides an index of physical features of the Moon for use in conjunction with a lunar globe. 50 cents. (U-S)

_____MOON GLOBE. #235. George F. Cram Company. A 10½" globe with cradle mounting and color shadings to depict the Moon's surface features. $9.95. (I-U-S)

Crawford, Deborah. THE KING'S ASTRONOMER. William Herschel. Messner, 191 p., 1968. $3.50. The life of a brilliant 18th century astronomer who made important contributions to the science of

astronomy in his day. Facts presented in fiction style. (U)

Creative Educational Society. ASTRONOMY. Earth Science Set #15. Creative Educational Society. A set of 6 color prints, 13" x 18" on heavy card stock with text material printed on the reverse sides. Includes the solar system, the Moon, the Sun, stars, the gas and dust of space, and the universe of galaxies. $6.95 per set. (I-U)

David, Heather. WERNHER von BRAUN. Putnam, 255 p., 1967. $3.64. A biography of one of Germany's World War II pioneer rocketeers who has contributed substantially to our nation's space program since his emigration to the United States. (U-S)

Defense, Department of, see U.S. Department of Defense

Denoyer-Geppert Company. ASTRONOMERS AT WORK. #421491. Denoyer-Geppert Company. A chart, 54" x 44" in color depicting astronomical instruments and how they are used; also, radio astronomy. $4.75. (U)

_____LAWS OF MOTION OF PLANETS AND SATELLITES. #420772. Denoyer-Geppert Company. A chart, 33" x 47" in color. Illustrates laws of celestrial mechanics—Kepler's three laws and Newton's law of gravity. $5. (U)

_____LIFE IN OTHER WORLDS. #421521. Denoyer-Geppert Company. A chart, 54" x 44" showing possible nature of life and conditions in other worlds. $4.75. (U)

_____LOOK AT THE STARS. #815622. Denoyer-Geppert Company. A 32-page manual to help teachers and students use a celestial globe. $1.50. (U)

_____OUR MOON. #421421. Denoyer-Geppert Company. A chart, 54" x 44" in color. Gives basic facts and relationships of the Moon to the Earth and Sun. $4.75. (U)

_____ROCKET chart. #420782. Denoyer-Geppert Company. 33" x 47", in color. Illustrates principles of rocket propulsion, Newton's law of motion, etc. Shows internal components of a rocket, and a launching sequence of a three-stage rocket with a satellite aboard. $5. (U)

_____ROCKETS AND SATELLITES. #421501. Denoyer-Geppert Company. A chart, 54" x 44", in color. Shows how rockets and satellites get into orbit and what they do. $4.75. (U)

_____SOLAR PLANETARY SYSTEM. #420442. Denoyer-Geppert Company. A chart, 40" x 28" in color. $4.50. (U)

_____THE SOLAR SYSTEM. #421431. Denoyer-Geppert Company. A chart, 54" x 44", in color, showing relative size of members of the solar system and their relationship to one another. Table of facts is included. $4.75. (U)

_____SPACE. #421411. Denoyer-Geppert Company. A chart, 54" x 44", in color, showing relationships of various parts of the universe—planets, stars, Milky Way, and galaxies. $4.75. (U)

_____SPACE TRAVEL. #421511. Denoyer-Geppert Company. A chart, 54" x 44", in color, depicting the sequence of events that leads man into space. Conditions in space are illustrated. $4.75. (U)

Department of Commerce, see U.S. Department of Commerce.

Department of Defense, see U.S. Department of Defense.

Department of Health, Education and Welfare, see U.S. Department of Health, Education and Welfare.

Department of Labor, see U.S. Department of Labor.

Department of Public Instruction, Commonwealth of Pennsylvania. EARTH AND SPACE GUIDE FOR ELEMENTARY TEACHERS. Available from the National Aerospace Education Council. Based on questions children have asked about the mysteries of Earth, Moon, Sun, stars, and space. Suggestions to teachers for developing concepts. 83 p., including a bibliography. $1. (A)

Dobson, G. M. B. EXPLORING THE ATMOSPHERE, 2d ed. Oxford University Press, 228 p., illus., 1969. $6.75. Additions to man's knowledge of the Earth's atmosphere as gained through the use of sounding rockets and artificial satellites. (A)

Dolezal, Erich. CONQUEST OF SPACE. Abelard, 132 p., illus., 1969. Paperback, $4.50. An overview of man's progress in space through the Apollo 8 flight, December 1968. Covers both Soviet and U.S. space programs. (U-S)

Dwiggins, Don. THE SST: Here it comes, ready or not. Doubleday, 294 p., illus., 1968. $6.50. The story of the supersonic transport—its development in Europe, the American version with its immense technical, political and international challenges, and its probable effects on flight. (S-A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

Eckman, Philip K. TECHNOLOGY AND SOCIAL PROGRESS—SYNERGISM OR CONFLICT? Volume 18, Science and Technology series. American Astronautical Society, 170 p., 1968. $9.75. Proceedings of the Sixth AAS Goddard Memorial Symposium held in March 1968. Examines the effect of technology on human progress (especially the effect of the space program on technology), U.S. growth patterns, and the balance between social and space goals. (S-A)

Editors of American Education Publications. LIVING IN SPACE. American Education Publications, 63 p., illus., 1968. Paperback, 30 cents. A review of developments in space biology. Considers extraterrestrial life, radiation, weightlessness, biosatellites, life support systems for man in space, the reuse of supplies in space, and many other related subjects. (U-S)

Editors of Science Experimenter. JUNIOR SCIENCE PROJECTS. Arco, 175 p., illus., 1967. $3.95. A collection of experiments and projects in many scientific fields, with step-by-step instructions, photographs, drawings and charts. Explains, by means of experimentation, scientific theory and principles, and their applications. Sample subjects are: ion-exchange fuel cell, infrared detector, echo collecting, matrix circuits, etc. (U-S)

Edmund Scientific Company. HOW TO USE YOUR TELESCOPE. #9055. Edmund Scientific Company. A booklet presenting an introduction to the stars and to astronomical telescopes. Covers the selection of a telescope, power, light gathering, field of view, eyepieces, and adjustments. 60 cents. (S)

_____MOON MAP. #9380. Edmund Scientific Company. Gives over 200 names of oceans, seas, mountains, craters, peaks, etc., with index. In color, 48½" x 53½". $1.95. (U-S-A)

_____MOON MURALS. Edmund Scientific Company. Black and white, 36" x 48": Southern sector of the Moon. #70,248. $7.50. Last quarter of the Moon. #70,243. $7.50. (U-S)

_____SOLAR CELL EXPERIMENT SET. #60,291. Edmund Scientific Company. A selection of selenium and silicon solar cells plus a cadmium sulphide photocell and handbook with explanations and suggestions for experimentation. $7.95. (S)

_____SOLAR PLANET DISPLAY. #70,873. Edmund Scientific Company. Built to scale. Shows the relative sizes of all nine planets in their order from the Sun, scaled 1" to 60,000 miles. 14⅜" x 2¾". $5. (I-U-S)

_____TELESCOPES YOU CAN BUILD. #9065. Edmund Scientific Company. Instructions for making 27 different telescopes and ten useful accessories. 75 cents. (S)

_____TIME IN ASTRONOMY. #9054. Edmund Scientific Company. Booklet explaining solar, sidereal, standard time, etc. How to use telescope setting circles, and how to adjust an equatorial mount. 75 cents. (S)

Edson, Lee. WORLDS AROUND THE SUN. The Emerging Portrait of the Solar System. American Heritage in association with The Smithsonian Institution, 160 p., illus., 1969. Available from Van Nostrand. $4.95. Answers basic questions about the solar system and how new knowledge gained from space exploration has changed fundamental ideas about the Sun, Moon, and planets. Discusses the tools of astronomy, the history of the study of the solar system, the space between the planets, extraterrestrial life, and the future of the solar system. (S-A)

Ehricke, Kraft and Betty A. Miller. EXPLORING THE PLANETS. Silver Burdett, 64 p., illus., 1969. Paperback, $1.35. A noted space scientist presents a step-by-step plan for the exploration of planets and other cosmic bodies. The equipment needed for such expeditions, and the hazards involved also are discussed. A book in the "21st Century Monografics" series. (I-U-S)

Ellison, M. A. THE SUN AND ITS INFLUENCE. American Elsevier, 256 p., rev. 1968 by Patrick Moore. $5.50. Discusses natural occurrences on the Sun, describes new instruments for the study of the solar atmosphere, and shows how solar radiation affects the Earth and space. (A)

Ely, Lawrence D. SPACE SCIENCE FOR THE LAYMAN. Thomas, 212 p., illus., 1967. $6.75. Many aspects of space science are explained in non-technical language. Discusses the value of space exploration, the type of technical information that has been obtained from space, and what is expected in the future. (A)

Emme, Eugene M. A HISTORY OF SPACE FLIGHT. Holt, 192 p., illus., 1965. Paperback, $1.96. A narrative of the development of space flight on a world-wide basis up to August 1965. (S)

Engelbrektson, Sune and Peter Greenleaf. LET'S EXPLORE OUTER SPACE. Sentinel, 128 p., illus., 1969. Paperback, $1.25. Provides simple research projects in space science, including safe experimentation with model rockets, weightlessness, life support systems, and the construction of simple

astronomical instruments to observe and measure movements of the Moon, planets, Sun, and stars. (S-A)

Englebardt, Stanley L. CAREERS IN DATA PROCESSING. Lothrop, 128 p., illus., 1969. $4.50. Discusses the many kinds of jobs available within the data processing career field, requiring various levels of preparation and offering a variety of applications. Personal histories of people now working in this career area are included. (U-S)

Estes Industries. EDUCATIONAL PACKET (Ed Pack). Estes Industries. A packet of materials explaining model rocketry and its use in motivating upper elementary, junior high school and senior high school students to study rocketry and other related scientific subjects. Packet includes past issues of *Model Rocket News,* technical reports, club guide, catalog, design booklet, safety literature, and other pertinent teaching aids. One packet free to teachers, leaders of youth groups, and other adults working with young people. Request must be submitted on official stationery, with official position stated. (A)

_____ESTES Model Rocket Supplies Catalog. Estes Industries. Information about model rockets, kits, accessories, rocket engines, launching devices, and other products of interest to modelers. Free. (U-S-A)

_____SATURN V model rocket. #691-K-36. Estes Industries. Scaled to 1/100th actual size. Stands 43½" tall. To be assembled for launching. Includes parachutes for returning Apollo capsule and main power section to Earth for reuse. Engines not included. $9.95. (U-S-A)

Executive Office of the President. U.S. AERONAUTICS AND SPACE ACTIVITIES, 1968. Report to the Congress from the President of the United States. #PREX 5.9:968. Supt. of Documents, 122 p., illus., 1969. Paperback, $1.25. Reports progress in space for 1968 made through such federal agencies as NASA, the National Aeronautics and Space Council, the Department of Defense, Atomic Energy Commission, National Science Foundation, the Department of Commerce, the National Academy of Sciences, Smithsonian Institution, the Federal Communications Commission, the U.S. Information Agency, and others. Includes spacecraft records and tables, logs of successful launches, budget figures, and many other kinds of information. (S-A)

Faget, Max. MANNED SPACE FLIGHT. Holt, 169 p., illus., 1965. Paperback, $1.96. Covers the development of manned spacecraft, the problems of astronaut training, and their solutions. (S)

Farley, T. A. SPACE TECHNOLOGY. Volume VI: Space Sciences. #NAS 1.21:114. Supt. of Documents, 84 p., 1967. Paperback, 35 cents. A basic text for college-level engineering students discussing the geomagnetic field, Van Allen belt, galactic and solar cosmic rays, comets, and dust. (A)

Fawcett, J. E. S. INTERNATIONAL LAW AND THE USES OF OUTER SPACE. Oceana, 67 p., 1968. $4. A review of the effects of the United Nations' Outer Space Treaty, including the character and limits of State jurisdiction and control over spacecraft, the military use of space, the management of space operations and control of their side effects including responsibility for damage, and the regulation of space communications. (A)

Feravolo, Rocco V. AROUND THE WORLD IN NINETY MINUTES: JOURNEY OF TWO ASTRONAUTS. Lothrop, 48 p., illus., 1968. $3.75. An introduction to space for the young reader. Interprets such phenomena as gravity, weightlessness, and orbiting spacecraft. Includes a description of a walk in space. (P)

_____WONDERS BEYOND THE SOLAR SYSTEM. Dodd, 64 p., illus., 1968. $3.25. Explains in simple terms theories about the beginning of the universe, comets, meteors, asteroids, galaxies, nebulae, constellations, and all kinds of stars. Discusses astronomical measurement, optical and radio telescopes, and the possibility of man ever reaching the stars. Includes simple activities for the reader. (I-U)

Field Enterprises Educational Corporation. EXPLORING SPACE. #SA-2420. Field Enterprises Educational Corporation. A 12-page guide for teachers of grades 4 through 10. Summarizes basic understandings about the universe, space, rockets, satellites, astronaut equipment, lunar, and interplanetary flight. Includes suggestions for study activities such as making a model solar system, writing space guide-books, tape recording simulated space flights, and exploring possibilities of life on other worlds. Single copy free to teachers. 25 cents to others. (A)

_____SPACE TRAVEL. 1970. #SA1794. Field Enterprises Educational Corporation. Reprint of the space travel article in the 1970 edition of *The World Book.* Describes and updates developments in space travel. Single copy free to teachers. 50 cents to others. (U-S-A)

Flight Systems, Inc. CATALOG of Model Rocket Supplies. Flight Systems, Inc. Gives technical data on items for sale and brief descriptions of rocket engine ballistics and thrust versus time curves for

Flight Systems, Inc. rocket engines. Catalog is free. (U-S-A)

Freundlich, Martin M. and Bernard M. Wagner. EXOBIOLOGY—THE SEARCH FOR EXTRATERRESTRIAL LIFE. Volume 19, Science and Technology series. American Astronautical Society, 184 p., 1968. $9.75. Surveys the physical environment of the Moon and planets, describes the means of detecting extraterrestrial life, and discusses the biochemical and sociological aspects of extraterrestrial life. (S-A)

Gagarin, Yuri and V. Lebedev. SURVIVAL IN SPACE. Praeger, 192 p., 1969. $5.95. The first Russian cosmonaut and a noted Russian psychologist, referring to both Soviet and American manned space flights, describe the psychological challenges and strenuous demands of future lunar and interplanetary space travel. They compare the ideal temperament required by space travel with the actual responses of Soviet cosmonauts. (S-A)

Gal, Guyala. SPACE LAW. Oceana, 627 p., 1969. $11. Deals with international space law and the uses of space as they affect the rights of individuals and air sovereignty. Discusses the legal status of space and celestial bodies, the positive and negative aspects of freedom of space and the peaceful uses of space. Also reports on the activity of the United Nations in regard to space and its use. (A)

Gallant, Roy A. EXPLORING MARS. Doubleday, 61 p., illus., rev. 1968. $3.95. A new look at the red planet, combining what pioneer astronomers learned and how they achieved their knowledge, with today's facts gathered through the use of spacecraft. Also discusses the numerous controversies existing among astronomers concerning Martian features. (U-S)

_____EXPLORING THE PLANETS. Doubleday, 128 p., illus., rev. 1967. $4.50. A non-technical description of our solar system. (U-S)

_____EXPLORING THE UNIVERSE. Doubleday, 64 p., illus., rev. 1968. $3.95. A history of the study of the heavens, giving the reader a background for understanding man's first steps into space. Discusses theories about the origins of the stars, Sun and planets; the life cycles of stars, light years, and many other topics of interest to those who wonder about the mysteries of the heavens. (U-S)

Gardner, Marjorie H. CHEMISTRY IN THE SPACE AGE. Holt, 168 p., illus., 1965. Paperback, $1.96. Discusses the chemistry of the solar system and beyond, including the possibility of life on the planets. (S)

Garelick, May. LOOK AT THE MOON. Scott, 32 p., illus., 1969. $3.95. A "concept" book that explores a simple question—does everyone all over the world see the same Moon that I see? (P)

Gates, Robert L. INERTIAL GUIDANCE SYSTEMS. Sams, 173 p., illus., 1968. Paperback, $4.95. An explanation of inertial guidance systems, what they are, how they work, and their application to missiles and spacecraft. A programmed learning course. (S-A)

General Electric Company. ASTROSOLAR MAP. #PIB-D-34. General Electric Company. A chart, 29" x 38", in color, illustrating the solar system and giving numerous facts about planets, the Moon, comets, asteroids, and other features of our solar system. Single copy free. (I-U-S-A)

_____MARS EXPLORATION CHART. #PIB-D-39. General Electric Company. A chart, 22" x 28", in color, illustrating numerous features of Mars and giving Martian facts as revealed by the Mariner IV spacecraft. Single copy free. (I-U-S-A)

_____THE MOON. #PIB-D-41. General Electric Company. A chart, 23" x 29", in color, displaying a map of the near side of the Moon, with name places and coordinates, and giving lunar data and an index to named lunar formations. Single copy free. (I-U-S-A)

George, Frances. YOU AND SPACE. National Aerospace Education Council. A 32-page illustrated primary grade supplementary reader to develop concepts of space and space travel. Suggestions for class discussion are included. 50 cents. (P)

Gilmer, J. R., A. M. Mayo, and R. C. Peavey, editors. COMMERCIAL UTILIZATION OF SPACE. Volume 23, Advances in the Astronautical Sciences series. American Astronautical Society, 512 p., illus., 1968. $23.50. Proceedings of the first national meeting devoted to a discussion of the commercial utilization of space, held in Dallas, May 1967. Covers space commerce, Earth-space applications, communication, broadcasting, weather, navigation, Earth resources, industrial research and manufacturing in space, medical research, space tourism, transportation, and the social, educational, and international implications. (S-A)

Glasstone, Samuel. THE BOOK OF MARS. #NAS 1.21: 179. Supt. of Documents, 315 p., illus., 1968. $5.25. Presents information gained about Mars over many years, using increasingly powerful and sensitive instruments and "gifted insights and rigorous induction." Discusses Mars' historical background, its relation to the solar system, atmosphere, surface, clouds, the possibility of life

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on Mars and its detection, and exploration of the planet by spacecraft. (S-A)

Glines, Carroll V. FIRST BOOK OF THE MOON. Watts, 96 p., illus., 1967. $2.95. Facts, figures, myths and theories of the Moon are outlined in this basic introduction for young readers. Also includes information on lunar probes and the Gemini and Apollo manned space flights. (I-U)

Goodrum, John. WERNHER VON BRAUN, Space Pioneer. Strode, 128 p., illus., 1969. $3.95. A biography of one of the world's foremost rocketry experts. The third volume in the "Heroes of Space" series. (U-S)

Goodwin, Harold L. THE IMAGES OF SPACE. Holt, 189 p., 1965. Paperback, $1.96. Discusses the effects of space exploration successes and failures on the struggle between the democratic and communistic ideologies. Considers the political, economic, social, and moral implications of historical space events, and their contributions to national images. (S)

Goran, Morris. EXPERIMENTAL ASTRONAUTICS. Sams, 168 p., illus., 1967. Paperback, $3.95. Basic physical principles of astronautics and astronomy demonstrated through 79 experiments. Data gathered in American and Soviet space flights are used to exemplify these principles. Includes a glossary. Experiments do not require a prior knowledge of space science, and necessary materials are, in most cases, readily available. (S-A)

Grissom, Virgil I. GEMINI: The Personal Story of America's Martyr Astronaut. Macmillan, 256 p., illus., 1968. Available from Collier-Macmillan Library Services. $5.95. The late "Gus" Grissom writes about the Gemini missions and their relationship to manned lunar landings. (U-S-A)

Grolier Educational Corp. MEASUREMENT, METEOROLOGY, AND ASTRONOMY. #TM403. Grolier Educational Corp. A textbook in programmed format including instructional materials on the metric system; methods of measuring length, speed, heat, temperature, and volume; astronomical instruments, the solar system, Earth's motion in space, and many other related topics. 1,916 frames, 450 p., two volumes. $12.50. (U)

Gurney, Gene. WALK IN SPACE: The Story of Project Gemini. Random, 192 p., illus., 1967. $1.95. An account of the two-man space flights of Project Gemini, emphasizing the achievements which led America to a manned landing on the Moon. (U-S)

Haber, Heinz. SPACE SCIENCE: A New Look at the Universe. Golden, 154 p., illus., 1967. $3.95. A reappraisal of the knowledge of our universe in the light of information resulting from space research. Summarizes findings derived from Ranger, Explorer, and Mariner spacecraft, and Earth satellites. Discusses space projects of the future. (S-A)

Haggerty, James J. APOLLO: LUNAR LANDING. Rand McNally, 160 p., illus., 1969. $4.95. A detailed report on Project Apollo—why, what, and how. A step-by-step explanation from launch to quarantine after the return from the Moon. (U-S)

Halacy, D. S. COLONIZATION OF THE MOON. Van Nostrand, 160 p., illus., 1969. $3.95. The technology required to overcome the difficulties of the Moon's environment is discussed in simple terms. Potential colonization of the Moon and its use for mining, manufacturing, testing sites, and as an observatory and base for more extensive exploration of space are also considered. (I-U)

_____THEY GAVE THEIR NAMES TO SCIENCE. Putnam, 159 p., illus., 1967. $3.29. Brief biographies of selected major scientists whose work provided the scientific background for much of today's technologies. Those in aerospace scientific fields are Mach, Doppler, Geiger, Van Allen, and de Coriolis. (U-S)

Hammond, Inc. THE EARTH IN SPACE. #8204. Hammond, Inc. Diagrams of the relative positions of the Sun and Earth at the times of the equinoxes and solstices. Includes numerous exercises and problems involving elementary geometry and algebra. $1. (U-S)

_____EXPLORATION OF SPACE. #9078. Hammond, Inc. A chart of the solar system, showing the orbits of the planets, possible surface features, artists' drawings of lunar spacecraft, and designs for possible future spacecraft. Includes facts about the planets 38" x 26", in color. $1.50. (I)

_____SPACE INFOGRAPH. #9090. Hammond, Inc. Brief facts about the Moon, Mercury, Venus, the Earth, and Mars, providing answers to usual questions about these members of the solar system. 50 cents. (I)

_____SPACESCAPES KIT. #9027. Hammond, Inc. Three-dimensional constructions of surface features of Mars, Saturn, Jupiter, Venus, Mercury, and the Moon, in color. $1.95. (I)

Hanrahan, J. S., editor. THE SEARCH FOR EXTRATERRESTRIAL LIFE. Volume 22, Advances in the Astronautical Sciences series. American Astronautical Society, 378 p., 1967. $15.75. A survey of knowledge of extraterrestrial life, including the basis of the search, vehicles and methods required for the

search, the possibility of life beyond the solar system, and the implications of the discovery of extraterrestrial life. (S-A)

Harris, Jacqueline L. LIVING IN SPACE. #366. American Education Publications, 63 p., illus., 1968. Paperback, 30 cents. An examination of the objectives and problems of space exploration from the point of view of the life sciences. Discusses extraterrestrial life, provisions for keeping man alive in space for extended periods, biosatellites, interplanetary exploration by man, and many other related topics. (S)

Hawk Model Company. EXPLORER 18. #553. Hawk Model Company. A plastic scale model with display stand that allows model to spin and rotate freely. Ready to assemble. $1.30. (I-U-S)

_____JUPITER-C ROCKET. #552. Hawk Model Company. A plastic scale model of the Explorer satellite launch vehicle, ready to assemble. Includes figures and decals. $1.30. (I-U-S)

_____MANNED ORBITING LABORATORY. #551. Hawk Model Company. A plastic model ready to assemble. Includes interior details, figures, display base, and a rocket re-entry vehicle. $1.30. (I-U-S)

_____VANGUARD SATELLITE. #515. Hawk Model Company. A plastic scale model of the first U.S. satellite. Ready to assemble. $1.30. (I-U-S)

Hawkins, Gerald S. SPLENDOR IN THE SKY. Harper, 292 p., illus., rev. 1969. $8.95. A history of astronomy emphasizing the contributions of noted astronomers of the past and explaining how space science has its roots in history. (S-A)

Hayes, E. Nelson. TRACKERS OF THE SKIES. Doyle, 169 p., illus., 1968. $5. Paperback, $3. A history of the satellite-tracking program of the Smithsonian Astrophysical Observatory. Tells the story of the scientists and engineers who designed and built the essential equipment, and who selected the 12 optical tracking sites in ten countries. Also discusses the observers' work and adventures in the countries where the tracking stations are located, and the processing and dissemination of data collected by the tracking stations. (A)

Health, Education, and Welfare, Department of, see U.S. Department of Health, Education, and Welfare.

Hellman, Hal. CONTROLLED GUIDANCE SYSTEMS. Sams, 244 p., illus., 1967. Paperback, $4.95. Fundamentals of guidance systems covering ballistic trajectory, hyperbolic guidance, celestial navigation and stellar-inertial guidance. Discusses principles, operating characteristics, and construction of various systems to increase understanding of their application in navigation and space travel. A semi-technical programmed text. (S-A)

_____LIGHT AND ELECTRICITY IN THE ATMOSPHERE. Holiday House, 223 p., illus., 1968. $4.50. The history of the science of the atmosphere, including lightning and thunderstorms, the ionosphere, solar wind, radiation belts, auroras, airglow, plasmas, and the Earth's magnetism. (U-S)

Hendrickson, Walter B., Jr. WHAT'S GOING ON IN SPACE? Harvey House, 48 p., illus., 1968. $2.75. A summary of U.S. space activities written in simple terms. Discusses rockets and how they work, satellites and orbits, manned space flight, lunar exploration, and interplanetary investigations by spacecraft. (I)

Henry, George E. TOMORROW'S MOON. Silver Burdett, 64 p., illus., 1969. Paperback, $1.35. Discusses possible activities for lunar pioneers—mining, establishing a fuel station for future spaceships, building an astronomical observatory, and using the Moon in medical therapy. A book in the "21st Century Monografics" series. (I-U-S)

Henry, James P. BIOMEDICAL ASPECTS OF SPACE FLIGHT. Holt, 174 p., illus., 1966. Paperback, $1.96. Discusses the many physiological problems faced by man in space, and how the problems are solved. (S)

Herron, Edward A. COBRA IN THE SKY, the Supersonic Transport. Crowell Collier, 201 p., illus., 1968. $3.95. A history of the development of the supersonic transport. Explains how the SST evolved, discusses the British-French SST, the *Concorde,* and tells how the U.S. version will be built and how it will operate. (U-S-A)

Hertz, Louis H. THE COMPLETE BOOK OF MODEL AIRCRAFT, SPACECRAFT, AND ROCKETS. Crown, 278 p., illus., 1967. $6.95. What the model aviation and space hobbyist need to know about selecting, building, flying and launching model aircraft and spacecraft with emphasis on safety. (S-A)

Hess, Wilmot N. 1967 SUMMER STUDY OF LUNAR SCIENCE AND EXPLORATION. #N67-40564. Clearing House, 398 p., illus., 1967. $3. Proceedings of a NASA-sponsored conference held at the University of California (Santa Cruz), July 31-August 13, 1967. Scientists from eight scientific disciplines—geology, bioscience, geophysics, etc. —make recommendations as to what they wish to

learn about the Moon and how this knowledge shall be derived during exploration of the Moon. Semi-technical. (A)

Hesse, Walter H. ASTRONOMY: A BRIEF INTRODUCTION. Addison-Wesley, 127 p., illus., 1967. Paperback, $2.95. A brief non-technical introduction to the science of astronomy for college freshmen and sophomores. (A)

Highland, Harold. HOW AND WHY WONDER BOOK OF PLANETS AND INTERPLANETARY TRAVEL. Grosset, 48 p., illus., rev. 1969. $1.25. Simple explanations of many basic principles and facts concerned with space flight—laws of motion, the mechanics of flight, the environment of space, rocket fuels, the planets, and solar system. (I-U)

Hirsch, S. Carl. ON COURSE, Navigating in Sea, Air, and Space. Viking, 156 p., illus., 1967. $4.50. A history of the science of navigation and its application to flight in the atmosphere and in space. Gives basic information on how astronauts navigate in space. (I-U)

Holder, William G. SATURN V, THE MOON ROCKET. Messner, 192 p., illus., 1969. $3.95. An account of the development of the Saturn V rocket booster that launches the Apollo manned spacecraft. Discusses early U.S. rockets (Viking, Thor, Jupiter, Redstone, etc.), how they were built, tested, and used. Also reports on launching operations and space tracking systems. (U-S-A)

Holmes, David C. SEARCH FOR LIFE IN OTHER WORLDS. Sterling, 224 p., illus., 1967. $3.95. Discusses the probabilities for and against finding life on other planets, and the role of radio in discovering extraterrestrial life. Reviews the history of investigation of life beyond the Earth from ancient times to the present. (U-S)

Honeywell. APOLLO. Stabilization and Control. Honeywell. An illustrated booklet discussing the stabilization and control subsystem of the Apollo spacecraft. Explains how the system works and what it does. Illustrates the various components of the system and includes a diagram of the lunar module main control panel elements. Free. (S-A)

Hough, Roger W. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. #4: Economic Impacts. Stanford Research Institute *Aerospace Systems Series,* Volume 5. 59 p., 1968. Available from Clearing House, #N68-34387. $3. Microfiche, 65 cents. Shows the positive influence NASA activities have had on southern communities where NASA activities are located. Discusses the improvement in the quality of education, the population growth, stimulation of local business and employment, upgrading of labor skills, and increasing per capita income. (A)

_____Gail L. Knudtson, and Shirley Thomas SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. #1. Identification of New Occupations—Formulation and Initiation of Study Stanford Research Institute *Aerospace Systems Series,* Volume 1, 26 p., 1968. Available from Clearing House, #N68-34391. $3. Microfiche, 65 cents. A report on a project to identify definitely space-oriented or space-directed occupations in NASA centers and in the aerospace manufacturing industry. Gives details of methods of research and also outlines recommendations to bring about government and industry adoption of new job titles. (A)

House of Representatives, see U.S. House of Representatives.

Hubbard, Earl. THE SEARCH IS ON. Pace Publications, 176 p., 1969. Paperback, $1.25. A view of man's future from the new perspective of space. Presents one man's concepts of what accomplishments in space mean to life today and in the future. Evaluates "the emancipation of man from the earth." (U-S)

Hubbard Scientific Company. ASTROLABE. #ECP-3014. Hubbard Scientific Company. For use in measuring declination, altitude and azimuth of planets, stars, the Moon, and locations on Earth. $1.25. (U-S)

_____LUMINOUS STAR FINDER. #SF-425. Hubbard Scientific Company. May be set to show the positions of stars for any hour and date. Simplified Star Map shows the constellations, stars to the fifth magnitude, nebulae, and the Milky Way. The major stars are printed in luminous ink to glow in the dark. Instructions and planet position table are included. 10¾" x 11½". $1.50. (U-S)

_____LUNAR SURFACE MODEL. #LSM-230. Hubbard Scientific Company. 18" x 24". Shows in relief craters, mountains, rills, "seas," and plains of the region surrounding the crater Copernicus. Scale model enables students to measure and determine depths of craters and heights of mountains. $8. (U-S)

_____SEASONAL STAR CHARTS. #SSC-426. Hubbard Scientific Company. 11" x 15", in color, showing star positions for each season as viewed from the Northern Hemisphere. Objects to be observed are described directly opposite each chart. $2.95. (S-A)

———————STUDENT PROJECT PLANETARIUM. #PR-160. Hubbard Scientific Company. 22" x 17". A small planetarium model and solar system chart that may be set to show actual positions of Earth, Moon, and planets at any given time. An illustrated Study Guide includes planet position tables. $3.95. (U-S)

Hubert, Lester F. and Paul E. Lehr. WEATHER SATELLITES. Blaisdell, 120 p., illus., 1967. Paperback, $2.95. Explains the manner in which satellite observations are interpreted and used. Also discusses the history of meteorological satellites, their equipment, data acquisition and reduction, and what we may expect from future weather satellites. (S-A)

Hult, J. L. SATELLITES AND TECHNOLOGY FOR COMMUNICATIONS: SHAPING THE FUTURE. #P-3760. Rand Corporation, 30 p., 1968. Paperback, $1. A paper prepared for the International Symposium on Satellite Communication at Zurich, Switzerland, April 1968. Discusses the technological potential and the social implications of communications satellites. Part III, on "Possible Applications and Social Implications," will be of special interest to social studies students. (S-A)

Hunter, Maxwell, W., II. THRUST INTO SPACE. Holt, 192 p., illus., 1966. Paperback, $1.96. Discusses the principles of rocket propulsion and propulsion requirements for interplanetary and interstellar travel. (S)

Hyde, Margaret O. EXPLORING EARTH AND SPACE. McGraw-Hill, 160 p., illus., rev. 1967. $3.95. About half of this book is devoted to space exploration—investigations of the Earth's magnetic field, worldwide communications systems and the developing knowledge of the Moon, planets and Sun through Earth satellites and space probes. (I-U)

———————OFF INTO SPACE! McGraw-Hill, 64 p., illus., rev. 1969. $3.95. Answers basic questions children have about long-term space travel: what will the space traveler wear, what will he eat, how long will he be gone, etc. Provides important facts about gravity, the solar system and rocketry. (I)

Hymoff, Edward. GUIDANCE AND CONTROL OF SPACECRAFT. Holt, 170 p., illus., 1966. Paperback, $1.96. Explains systems used to guide and control spacecraft on various kinds of missions, both manned and unmanned. (S)

Hynek, Allen. EXPLORING THE UNIVERSE. American Education Publications, 47 p., illus., rev. 1968. Paperback, 30 cents. Discusses the solar system, stars, observatories and planetariums, manned spacecraft, artificial satellites, the role of balloons in space observations, radio astronomy, telescopes, and many other related topics. (U-S)

Independent Tracking Coordination Program. SATELLITE PREDICTION INFORMATION. Independent Tracking Coordination Program. Up-to-date information necessary to predict when and in what direction to observe any of more than 500 unclassified artificial Earth satellites. A number of these are bright enough to be seen with the naked eye and a number transmit radio signals. Biweekly airmail announcements define the shape and position of the orbit and rates of motion for a particular instant when the satellite is closest to the Earth (epoch of perigee). Annual subscription rates for the airmail mean orbital element announcement services are: United States, Canada, and Mexico, $3.25; overseas: $6.50. The service is available to students free on a 6-month trial basis.

The information needed to select appropriate satellites for photographic, optical, binocular, telescopic or radio observation is furnished as part of the service. Instructions on how to make predictions include graphic methods for determining local look angles and range. Similar methods for determining sky brightness, whether or not the satellite is in sunlight and apparent satellite brightness are useful in planning photographic and visual observations. Additional graphic methods permit plotting the apparent position and direction of motion of the satellite on a Star Chart. Such mappings are useful in picking out the fainter satellites with binoculars, or in guiding a telescope mounted on an equatorial axis. More precise methods for use with desk calculators are also available, along with instructions on how individual observer teams may support orbit analysis and improvement programs on selected satellites. Listings, write-ups, input-output examples describing efficient digital computer programs for generating station predictions are available without charge. A kit consisting of various charts, graphs, and a stereographic net for efficient graphic prediction of satellite look angles is available for $1. For use in more precise desk-calculator predictions and orbit analysis—SEVEN PLACE COSINES, SINES AND TANGENTS FOR EVERY TENTH MICROTURN is available for $2. Also available at $2 per copy is the RATIONALIZED GENERAL CATALOG OF 33,342 STARS, EPOCH 1950.0. (S-A)

Institute of Electrical and Electronic Engineers. FREQUENCY SPECTRUM CHART. Institute of Electrical and Electronic Engineering. Approximately 40" x 15", in color, showing the range of electromagnetic wave lengths and illustrating numerous

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details as to man's use of these frequencies on Earth and in space, and the propagation effects, generation and side effects of these natural phenomena. Free. (U-S-A)

International Business Machines Corporation. COMPUTERS IN ACTION: TEN DAYS THAT MADE SPACE HISTORY. International Business Machines Corporation. An illustrated booklet describing how IBM computers assisted in ten major U.S. space events. Single copy free. (U-S)

Isaccs, Theodore, editor. PROJECT NERO, Near-Earth Rescue and Operations. M. I. T. Press, 266 p., illus., 1967. Paperback, $7.50. A report giving the results of a design study undertaken by students at the Massachusetts Institue of Technology as part of the Advanced Space Systems Engineering course. While involved in this study, the students were given practical experience and responsibility comparable to that which they could expect when employed in industry or government. The design called for a versatile vehicle capable of rescuing astronauts in distress, delivering supplies to orbiting spacecraft, repairing malfunctioning unmanned satellites, and inspecting unidentified orbiting objects. Semi-technical. (A)

Jaffe, Leonard. COMMUNICATIONS IN SPACE. Holt, 167 p., illus., 1966. Paperback, $1.96. Explains theories and operation of communications satellites such as Echo, Relay, Telstar, and Syncom spacecraft. Also considers the future of this kind of communications system. (S)

Jastrow, Robert. RED GIANTS AND WHITE DWARFS. Harper, 176 p., illus., 1967. $5.95. Man's history is traced back to "a swirling cloud of primordial hydrogen" billions of years before even our solar system was formed. A discussion of the emergence of intelligent life is expanded to include an examination of the possibilities of extraterrestrial life. (S-A)

Jet Propulsion Laboratory. MARINER-MARS, An Interplanetary Spacecraft. Jet Propulsion Laboratory. An illustrated brochure outlining the mission of the spacecraft that investigated Mars in 1965. Gives details of the spacecraft, its complicated trajectory, instruments aboard, and some results of its investigations. Free. (S-A)

_____MARINER VI AND VII—MARS 1969. Jet Propulsion Laboratory. An illustrated leaflet describing the missions of spacecraft investigating Mars in 1969. Free. (S-A)

_____PIONEERING IN SPACE. Jet Propulsion Laboratory. An illustrated brochure describing the work of the Jet Propulsion Laboratory, a government-owned research and development center operated by the California Institute of Technology under contract to NASA. Covers historical achievements, the Ranger, Surveyor, and Marine spacecraft development, and the deep-space world-wide tracking network. Free. (S-A)

_____RANGER. A Lunar Exploration Spacecraft. Jet Propulsion Laboratory. An illustrated brochure describing the mission of the photo-taking lunar spacecraft probe, and its results. Free. (S-A)

_____SURVEYOR. Soft-Landing Lunar Spacecraft. Jet Propulsion Laboratory. An illustrated brochure describing the Surveyor spacecraft, its mission on the Moon, and the results. Free. (S-A)

Jones, R. J. and others. METEOROLOGICAL PROBLEMS IN THE DESIGN AND OPERATION OF SUPERSONIC AIRCRAFT. Technical Note. No. 89. World Meteorological Organization, 71 p., illus., 1967. Available from UNIPUB. Paperback, $3.50. A discussion of the operational problems of the SST relating to weather and the atmosphere. Considers sonic boom, turbulence, solar flares, precipitation, and other phenomena. Also indicates what kinds of meteorological information will be needed to assure a safe and economical flight for the SST. While the book is a technical report, much of the text will be understood by the general reader. (S-A)

Junior Engineering Technical Society. THE JETS PROGRAM. Junior Engineering Technical Society. A booklet explaining the purposes of JETS (Junior Engineering Technical Society) and how to organize and obtain sponsorship for a student chapter in this non-profit educational organization for stimulating interest in engineering and technical careers. Free. (S)

Karman, Theodore von with Lee Edson. THE WIND AND BEYOND. Little, Brown, 367 p., illus., 1967. $10. An autobiographical account of one of the outstanding scientists of the twentieth century who made many contributions to aeronautics and astronautics. As a teacher, he influenced many young men who later became leaders in development of the nation's aviation and space fields. (S-A)

Kash, Don E. THE POLITICS OF SPACE COOPERATION. Purdue University Studies, 137 p., 1967. $4.95. A study of the foreign policy implications of U.S. participation in international space programs. Emphasizing the peaceful rather than the military activities in space, the study examines U.S. goals, the means of achieving them, and

whether these means are leading the nation toward unanticipated results. (S-A)

Kavanau, L. L., editor. PRACTICAL SPACE APPLICATIONS. Volume 21, Advancement in the Astronautical Sciences series. American Astronautical Society, approximately 500 p., 1967. $15.75. Discusses the practical applications resulting from our national space program, such as communications, meteorological and navigational satellites, and the potential uses of spacecraft, such as for surveying Earth's natural resources and crops, and for medical purposes. (S-A)

Keen, Martin. THE WONDERS OF SPACE: ROCKETS, MISSILES, AND SPACECRAFT. Grosset, 160 p., illus., 1967. $3.95. Information about rocketry and spacecraft, and a history of the exploration of space, including the complete series of Gemini flights. (I-U)

Keene, George T. STAR GAZING WITH TELESCOPE AND CAMERA. Chilton, 128 p., illus., rev. 1967. $3.50. Instructions for choosing and using telescopes and binoculars, grinding lens, assembling a reflecting telescope, and selecting the proper type of camera. Also includes material on lunar photography. (S)

Kennan, Erlend A. and Edmund H. Harvey, Jr. MISSION TO THE MOON. Morrow, 396 p., illus., 1969. $7.95. A critical examination of NASA and the nation's space program. Discusses the "race to the Moon," and suggests that NASA's program in the future be considered as just one of several national technological and scientific endeavors required by the nation. (A)

Kepler, Johann. KEPLER'S SOMNIUM: THE DREAM, OR POSTHUMOUS WORK ON LUNAR ASTRONOMY. Translated with commentary by Edward Rosen. University of Wisconsin Press, 255 p., illus., 1967. $8.75. An English translation in full with extensive notes to clarify Kepler's obscurities. Traces the history and importance of this work. Recipient of the 1968 Pfizer Award of the History of Science Society. (S-A)

King-Hele, Desmond. THE SHAPE OF THE EARTH. #873. W. H. Freeman Company. A 9-page reprint of an article from the October 1967 issue of *Scientific American* explaining how the shape of the Earth is determined through the use of artificial satellites. Also gives the history of man's attempts to determine the shape of the Earth. 20 cents. (S-A)

Kleiman, Louis A., editor. PROJECT ICARUS. M. I. T. Press, 121 p., illus., 1968. Paperback, $6.95. A report of a Massachusetts Institute of Technology student project providing a plan for avoiding a hypothetical collision in June 1968 between the Earth and the asteroid Icarus. Describes the 'crash" program the students developed, harnessing all the financial, technical, and industrial resources of the nation to meet the "crisis." The realistic project ends in the development of an intercept monitoring satellite with a nuclear warhead, designed to push the asteroid off course or to destroy it. Semi-technical. (A)

Knight, David C. COMETS. Watts, 85 p., illus., 1968. $2.95. An introduction to the study of comets. Considers their origin, discovery, structure, composition, and motion. Gives facts about the more famous and prominent comets. (U-S)

_____THE FIRST BOOK OF THE SUN. Watts, 89 p., illus., 1968. $2.95. How man has gathered knowledge of the Sun, and what facts he has discovered. Discusses the place of the Sun in the universe and galaxy, the Sun's surface features and atmosphere, movement, and solar energy. (U-S)

_____METEORS AND METEORITES. Watts, 91 p., illus., 1969. $2.95. An introduction to meteoritics explaining the differences among meteroids, meteors, and meteorites, and the phenomena associated with them. (U-S)

Koenig, L. R. HANDBOOK OF THE PHYSICAL PROPERTIES OF THE PLANET VENUS. #NAS 1.21:3029. Supt. of Documents, 132 p., illus., 1967. Paperback, 60 cents. Summarizes present knowledge of and outlines various theories concerning the planet Venus. (S-A)

Konecci, Eugene B., editor. ECOLOGICAL TECHNOLOGY—SPACE-EARTH-SEA. Bureau of Business Research, University of Texas, 300 p., illus., 1967. Paperback, $5. Proceedings of the first Technological Transference Symposium, February 14-15, 1966, in which experts from the fields of science, engineering, economics, law, sociology, philosophy, architecture, government and oceanography discuss the advances being made in outer space and in the depths of the ocean that give rise to a technology which promises great benefits to man. (A)

_____and others, editors. SPACE AGE IN FISCAL YEAR 2001. Volume 10, Science and Technology Series, American Astronautical Society, 446 p., illus., 1967. $14.25. A look at the future of space as industry and government scientists and engineers discuss their ideas of how man's activities in space at the beginning of the 21st century will affect technology, transportation, commerce, education, city planning, and many other facets of life. A good portion of the book is

somewhat technical, but the remainder is not difficult for the advanced high school student and adults. (S-A)

Krieger, S. J. SPACE PROGRAMS OF THE SOVIET UNION. #AD-656-546. Clearing House, 17 p., 1967. $3. A brief review of Soviet space flights. (S-A)

Labor, Department of, see U.S. Department of Labor

Land, Barbara. THE TELESCOPE MAKERS. From Galileo to the Space Age. Crowell, 245 p., illus., 1968. $4.50. A history of the telescope told through the lives of ten men who developed it in its many forms. Radio telescopes are included as well as the first rocketborne telescope sent aloft at White Sands Missile Range in 1949. (U-S)

Leavitt, William and others. THE SPACE FRONTIER WITH ASTRONAUTICS GLOSSARY. National Aerospace Education Council. A 32-page, illustrated booklet giving concepts of space and describing the hazards of space travel. The Glossary defines more than 680 space age terms. 50 cents. (U-S)

Levitt, I. M. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. Astronomy As An Example of Scientific Impacts. Stanford Research Institute *Aerospace Systems Series,* Volume 3. 60 p., 1968. Available from Clearing House, #N68-34390. $3. Microfiche, 65 cents. Discusses the revolution in astronomy resulting from new error-free methods and new facts derived from exploration of the planets and sun by unmanned spacecraft. (A)

_____, John Baird, and others. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. #7: Final Pilot Study Report. Stanford Research Institute *Aerospace Systems Series,* Volume 7. 54 p., 1968. Available from Clearing House, #N69-12564. $3. Microfiche, 65 cents. A summary of the six areas of study covered by the Aerospace Systems Series. Spin-off benefits of the space program were defined and measured for their impacts upon aviation, science, materials technology, economy, public health, medicine, biology, and newly derived occupations. The study found that the very successful technological advances were not positively presented to the American public for full appreciation. (A)

Lewis, Claudia. POEMS OF EARTH AND SPACE. Dutton, 48 p., illus., 1967. $3.75. A collection of children's poems about "planetoids and rocket cones" and other man-made objects whirling about in space. Written by a teacher of literature and creative writing. (I-U)

Lewis, Richard S. APPOINTMENT ON THE MOON: The Inside Story of America's Space Program. Viking, 434 p., illus., rev. 1969. $10. An overview of the U.S. space program up to preparations for landing on the Moon. Also includes background material on German rocketry during World War II, and forecasts for the exploration of the lunar surface in the 1970's. (S-A)

Ley, Willy. EVENTS IN SPACE. McKay, 180 p., illus., 1969. $4.95. A history of space exploration covering the scientists, astronauts, and space vehicles that have figured in the "race of nations into the solar skies." Also comments on future space flight. (S)

_____INSIDE THE ORBIT OF THE EARTH. McGraw-Hill, 160 p., illus., 1968. $4.50. The planets Mercury and Venus are described in terms of history and knowledge acquired through space probes. (U-S)

_____ROCKETS, MISSILES, AND MEN IN SPACE. Viking, 640 p., illus., rev. 1968. $10.95. A source book on space technology with historical material, and facts and interpretations about the last decade's advances. (S-A)

_____VISITORS FROM AFAR: THE COMETS. Dutton, 144 p., illus., 1969. $4.50. Facts about comets in general, and about Halley's comet, in particular. Also investigates the possibility of sending a space probe to a comet. (U-S)

Lovell, Bernard. OUR PRESENT KNOWLEDGE OF THE UNIVERSE. Harvard University Press, 104 p., illus., 1967. $2.95. Paperback, $1.80. Emphasizes findings through radio telescopes, especially the five major radio telescopes at Jodrell Bank in England. (S-A)

_____THE STORY OF JODRELL BANK. Harper, 265 p., illus., 1968. $5.95. An account of the construction of the famous British radio telescope, written by the distinguished scientist who saw the realization of his life-long dream. Describes the part this piece of equipment played in the early days of the U.S. space program. (S-A)

_____and others. THE NEW UNIVERSE. Rand McNally, 128 p., illus., 1968. $8.95. A collection of ten articles written by leading astronomers. The articles appeared originally in the *Science Journal* but have been updated. They cover a wide range of astronomical topics—radio astronomy, interstellar magnetic fields, the effect of gravitation on the universe, and informed views on trends and developments in astronomy today. (A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

Lukashok, Alvin. COMMUNICATIONS SATELLITES: HOW THEY WORK. Putnam, 160 p., illus., 1967. $3.29. Simple explanations of the scientific principles behind the operation of communications satellites, such as signal transmission, amplification and reception, power generation and satellite tracking. (I-U-S)

Lytleton, R. A. MYSTERIES OF THE SOLAR SYSTEM. Oxford University Press, 272 p., illus., 1968. $7. A collection of seven essays discussing the origin of the solar system, terrestrial planets, comets, tektites, and the discovery of Neptune. Also draws attention to the new attitudes of scientists derived from modern space research. (A)

Malewicki, Douglas. MODEL ROCKET ALTITUDE PERFORMANCE. #TIR-100. Centuri, 52 p., illus., 1968. Paperback, $1. Uses graphs and explanations to assist in understanding the interrelationship among parameters, such as engine thrust, rocket weight, aerodynamic drag on various nose and body shapes, and how these parameters affect altitude performance. Graphs permit selection of engines for specific altitudes without the use of mathematics. Useful for model rocket design reference. (U-S-A)

Malina, Frank J. THE ROCKET PIONEERS. Jet Propulsion Laboratory. A reprint from the February 1968 edition of *Engineering and Science* describing the early days of rocketry at the California Institute of Technology and some of the pioneering rocket experts, such as Robert Millikan and Theodore von Karman. Free. (S-A)

Maloney, Terry. TELESCOPES: How to Choose and Use Them. Sterling, 143 p., illus., 1968. $3.95. Advice for the amateur astronomer, with information about radio astronomy and suggestions for observing the planets, as well as stars and constellations. (S-A)

Marshall, Jane N., editor. SOURCES OF PICTURES, PAMPHLETS AND PACKETS. 7th edition, 1967. National Aerospace Education Council. A comprehensive annotated and graded list of selected aerospace education teaching aids—booklets, pamphlets, charts, pictures, leaflets, bibliographies, units, etc.—produced by aerospace manufacturers, airlines, government agencies, and private and professional organizations on aviation and space flight subjects. Most of the items are free. None costs more than $10. 50 cents. (A)

Maryland Academy of Sciences. GRAPHIC TIME TABLE OF THE HEAVENS. Maryland Academy of Sciences. A condensed and simplified almanac in graphic form published annually. Gives rising and setting times of the Sun, Moon and brighter planets, occurrences of eclipses and other useful astronomical information, including instructions for using the Time Table. While the Time Table is computed for 40° north latitude and 90° west longitude, a correction table for using it at other locations is provided. Large chart, 40" x 27", $1.40 folded, or $1.75 rolled. Small chart, 17" x 11", 45 cents. Discount on quantity orders. (S-A)

Mathematical Association of America. GUIDEBOOK TO DEPARTMENTS IN THE MATHEMATICAL SCIENCES IN THE UNITED STATES AND CANADA. 3rd edition, 1968. Mathematical Association of America. A summary of facts about the location, size, staff, library facilities, course offerings, and special features of departments in mathematical sciences in four year colleges and universities. 50 cents. (S)

_____PROFESSIONAL OPPORTUNITIES IN MATHEMATICS. 7th edition, 1967. Mathematical Association of America. A 32-page booklet discussing employment of mathematicians in industry, government, and in the teaching profession. Describes work, qualifications, and training, and where employment may be found. 35 cents. (S)

_____YOU'LL NEED MATH. Mathematical Association of America. An illustrated booklet on the importance of mathematics in many career fields. Also discusses the various levels of mathematics required for various occupations. Free. (U-S)

May, Julian. ASTRONAUTICS. Follett, 32 p., illus., 1968. $1. Scientific principles of space flight explained for young readers. (P-I)

_____ROCKETS. Follett, 32 p., illus., 1967. $1. A brief history of rocketry with explanations of the principles of rocket propulsion and the uses of rockets—written for the beginning reader. (P)

Mayall, R. Newton and Margaret W. Mayall. SKY-SHOOTING—PHOTOGRAPHY FOR AMATEUR ASTRONOMERS. Dover, 186 p., illus., rev. 1968. Paperback, $2.75. Basic know-how for the amateur astronomer who wants to combine his interest in astronomy with his hobby of photography. Also includes information about cameras, film, and developing processes, and sophisticated equipment for the more advanced amateur. (S-A)

McCauley, John F. MOON PROBES. Silver Burdett, 64 p., illus., 1969. Paperback, $1.35. Vital data on the Moon provided by the unmanned lunar probes, Ranger, Surveyor, and Lunar Orbiter, plus

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

Soviet spacecraft. Non-technical explanations. A book in the "21st Century Monografics" series. (I-U-S)

McIntyre, Kenneth M., editor. SPACE SCIENCE EDUCATIONAL MEDIA RESOURCES. A Guide for Junior High School Teachers. Bureau of Audio-visual Education, University of North Carolina, 107 p., rev. 1966. Paperback. $3.50. Course outlines, activities, and related audio-visual and classroom materials. While much of the material deals with Earth science, a major portion includes elementary astronomy limited to the solar system and the place of the Earth in the Sun's family. Space exploration is treated as a related topic. For the teacher. (A)

Meeter, George F. THE HOLLOMAN STORY. University of New Mexico Press, 203 p., illus., 1967. $5.95. An eyewitness account of the beginnings of research in the space age, and a look to the future when men will travel beyond the Moon to the edges of the solar system. Discusses rocket-sled testing, weightlessness, and balloon research. Semi-technical. (S-A)

Mehlin, Theodore G. ASTRONOMY AND THE ORIGIN OF THE EARTH. Brown, 144 p., illus., 1968. Paperback, $1.95. An overview of today's thinking in astronomy with particular emphasis on the solar system and Earth's relations to the Sun and planets. A book in the "Foundations of Earth Science" series. (S-A)

Michaux, C. M. HANDBOOK OF THE PHYSICAL PROPERTIES OF THE PLANET JUPITER. #NAS 1.21:3031. Supt. of Documents, 142 p., illus., 1967. Paperback, 60 cents. A summary of present knowledge and the latest hypothesis regarding the planet Jupiter. (S-A)

_____HANDBOOK OF THE PHYSICAL PROPERTIES OF THE PLANET MARS. #NAS 1.21:3030. Supt. of Documents, 167 p., illus., 1967. Paperback, 70 cents. Summarizes knowledge about and outlines theories concerning the planet Mars. (S-A)

Miernyk, William H., and others. IMPACT OF THE SPACE PROGRAM ON A LOCAL ECONOMY. West Virginia University Library, 167 p., illus., 1967. $6. An analysis of the job and income creating aspects of the national space program focusing on a Boulder, Colorado study that showed that "even in a small economy, space expenditures have a substantial multiplier effect." (A)

Monogram Models, Inc. APOLLO-SATURN. #PS 193. Monogram Models, Inc. Model kit of America's Moon rocket, 1/144th scale, 30" tall with all stages separate, and with Apollo spacecraft. $6. (U-S)

_____BOEING SST SUPERSONIC TRANSPORT. #PA211. Monogram Models, Inc. Ready-to-assemble model of the first Boeing SST design. Includes decals and display stand. Wings can be moved to simulate high or low speed attitude. $1. (U-S)

Moore, Carleton. COSMIC DEBRIS. Silver Burdett, 64 p., illus., 1969. Paperback, $1.35. An examination of meteors, asteroids, comets and other kinds of cosmic matter. A book in the "21st Century Monografics" series. Non-technical language. (I-U-S)

Moore, Patrick. THE PICTURE HISTORY OF ASTRONOMY. Grossett, 253 p., illus., rev. 1967. $6.95. An historical account of progress in astronomy, including new techniques evolving from the exploration of space by manned and unmanned spacecraft. Radio astronomy and space probe are discussed. (U-S)

_____SPACE. Doubleday, 215 p., illus., 1968. $12.95. An account of man's greatest feat of exploration, providing an introduction to the study of space. (S-A)

_____and Peter Cattermole. CRATERS OF THE MOON: AN OBSERVATIONAL APPROACH. Norton, 160 p., illus., 1967. $5.95. A review of some of the theories about the origin of the Moon's craters. (S-A)

Morenoff, Jerome. WORLD PEACE THROUGH SPACE LAW. Michie, 340 p., illus., 1967. $10. The traditional rights of nations concerning reconnaissance, and how these rights might be reconciled in the Space Age under a proposed cooperative international system of surveillance. (A)

Murchie, Guy. MUSIC OF THE SPHERES. Volume 1. The Macrocosm: Planets, Stars, Galaxies, Cosmology. Dover, 225 p., illus., rev. 1967. Paperback, $2. An updated edition of a popular non-mathematical survey of the physical universe first published in 1961. Volume 1 of this two-volume edition considers the materials of the Earth's core and outer layers, current theories of the Moon's origin, facts about the planets, sunspot activities, theories of the universe, comets and many other related topics. (S-A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

_____MUSIC OF THE SPHERES. Volume 2. The Microcosm: Matter, Atoms, Waves, Radiation, Relativity. Dover, 414 p., illus., rev. 1967. Paperback, $2. Volume 2 of a two-volume edition of a popular non-mathematical survey of the physical universe, first published in 1961. Volume 2 considers the nature of matter, the dynamics of matter (Newton's laws of motion, acceleration, gravity), radiation, relativity, and the world's great scientists who have contributed to our knowledge of the universe—Tycho Brahe, Galileo, Kepler, Copernicus, Newton, Faraday, Maxwell, Orenz, and Einstein. (S-A)

Muirden, James. AMATEUR ASTRONOMER'S HANDBOOK. Crowell, 355 p., illus., 1968. $6.95. Detailed advice for the novice who wants to make his own telescopic observations. Discusses the most suitable kinds of equipment, factors affecting the quality of observation and how adverse circumstances can be overcome. Describes the Moon, Sun, planets, comets, stars and galaxies as the amateur will see them through a small-to-medium-size telescope. Includes tables on future solar and lunar eclipses, planetary positions, and expected comet returns to 1986. Lists recommended readings and astronomical societies. (S-A)

NASA, see U.S. National Aeronautics and Space Administration.

Nasca, Donald and Mario E. Motter. ASTRONOMY AND SPACE. #589. Instructor Publications. 1968. Ten colorful display charts, 16" x 25", with 12-page teacher's guide and supplemental pupil activities. Covers space, the Sun, the planets, satellites, comets and meteors, constellations, telescopes, navigation by stars, space flight, and space exploration. $3 per set. (I)

National Academy of Sciences, National Research Council. PHYSICS OF THE EARTH IN SPACE. A Program of Research, 1968-75. Space Science Board, 109 p., 1968. Single copy free. Includes a summary of present knowledge of the physics of the Earth in space, and lists major unanswered scientific questions that might be investigated in the next five years. Semi-technical. (A)

_____PLANETARY ASTRONOMY: An Appraisal of Ground-Based Opportunities. #1688. Space Science Board, 76 p., illus., 1968. Paperback, $3.50. A study that examines the contributions ground-based facilities and techniques can make to support planetary exploration through space vehicles. Semi-technical. (S-A)

_____PLANETARY EXPLORATION 1968-1975. Space Science Board, 48 p., 1968. Single copy free. A report of a study by the Space Science Board, summarizing the results of planetary exploration and recommending to NASA steps that might be taken in further planetary exploration to 1975. (S-A)

_____UNITED STATES SPACE SCIENCE PROGRAM. Report to COSPAR. Space Science Board, 250 p., illus., 1969. Single copy free. An extensive review of U.S. space science during the previous year, with a comprehensive bibliography. The Report has been issued annually since 1960, but some earlier editions are out of print. Semi-technical. (A)

_____USEFUL APPLICATIONS OF EARTH-ORIENTED SATELLITES. Space Science Board, 34 p., 1969. Paperback, $2. A study that considered how Earth-orbiting satellites could have direct and beneficial impacts on the social, economic, and industrial activities of the world. Identifies applications where satellites may play a useful role in our daily lives and considers whether the cost of employing satellites for these roles is justified. (S-A)

National Aerospace Education Council. INVITATION TO MEMBERSHIP IN THE NATIONAL AEROSPACE EDUCATION COUNCIL. National Aerospace Education Council. A brochure describing the aims, objectives, services, and publications of NAEC, a non-profit, professional aerospace education organizations. Free. (A)

_____PROJECT APOLLO. National Aerospace Education Council. Chart 44" x 25" with 27 captioned drawings, photographs and diagrams tracing, step by step, how astronauts land on the Moon and how they return to Earth. $1. (I-U-S)

_____ROBERT GODDARD: "FATHER" OF MODERN ROCKETRY. National Aerospace Education Council. Illustrated booklet giving the main facts of Dr. Goddard's life and work. Includes hard-to-find information, such as Dr. Goddard's autobiography written in 1927, and a compilation of Goddard exhibits, honors, and memorials. 50 cents. (U-S-A)

_____ROBERT H. GODDARD PORTFOLIO No. 1. National Aerospace Education Council. Ten selected black-and-white captioned pictures from the life and work of the "father" of modern rocketry, specially selected by Mrs. Robert Goddard. 8½" x 11". $1 per set. (I-U-S-A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

_____SUGGESTIONS FOR COMMEMORATING GODDARD DAY—March 16. National Aerospace Education Council. A 4-page leaflet calling attention to the significance of March 16 and providing numerous suggestions for individual and class activities for commemorating the anniversary of the first flight of a liquid fuel rocket. One copy free. (A)

National Council on Marine Resources and Development, see U.S. National Council on Marine Resources and Development.

National Association of Rocketry. MODEL ROCKETRY. The Educational Space-Age Hobby. National Association of Rocketry. An illustrated leaflet explaining the model rocketry safety program of the National Association of Rocketry, including model rocketry facts, competition, safety, and the advantages of forming chartered NAR rocket clubs. Free. (U-S-A)

National Geographic Society. EARTH SHADOW MAKES MOON FADE. National Geographic Society. *National Geographic School Bulletin.* Volume 47, No. 4, September 30, 1968. 10 cents. An explanation of a lunar eclipse. (I-U)

_____THE EARTH'S MOON. National Geographic Society. 42" x 28". Paper edition $2, plus 15 cents postage and handling; plastic edition $3, plus 30 cents postage and handling. (U-S-A)

_____A LIST OF ASTRONOMY articles appearing in issues of the *National Geographic Magazine* from November 1932 through May 1969. National Geographic Society. Free. (U-S-A)

_____A LIST OF SPACE TRAVEL articles appearing in issues of the *National Geographic Magazine* from December 1926 through May 1969. National Geographic Society. Free. (U-S-A)

_____MACHINES GIVE MEN RUNNING START IN LEAP TO THE MOON. National Geographic Society. *National Geographic School Bulletin.* Volume 46, No. 25, March 18, 1968. 10 cents. How unmanned spacecraft have helped plan for manned exploration of the Moon. Also briefly describes the development and manufacturing of lunar probes such as *Ranger, Surveyor,* and *Lunar Orbiter.* (I-U)

_____MAN'S CONQUEST OF SPACE. National Geographic Society, approximately 200 p., illus., 1968. $4.25. A brief history of space travel, together with milestones of the first ten years of the Space Age, and current plans for exploration of the Moon and beyond. (S-A)

_____MAP OF THE HEAVENS. National Geographic Society. In color, 42" x 28". Shows stars, Milky Way, constellations visible in each hemisphere, Zodiac signs, and star positions for each month. Paper edition, $2, plus 15 cents postage and handling; plastic edition, $3, plus 30 cents postage and handling. (U-S-A)

_____MOONCRAFT INSPIRES SPACE AGE STUDENT. National Geographic Society. *National Geographic School Bulletin.* Volume 46, No. 29, April 29, 1968. 10 cents. Student constructs a model of *Surveyor* that wins him a scholarship and a summer job at Cape Kennedy. (I-U-S)

_____RADIO TELESCOPES HELP BOY EAVESDROP ON THE STARS. National Geographic Society. *National Geographic School Bulletin,* Volume 47, No. 20, February 10, 1969. 10 cents. A young student tours the national Radio Astronomy Observatory at Green Bank, West Virginia. (I-U)

_____SCIENCE FICTION COMES TO LIFE IN LUNAR LAB. National Geographic Society. *National Geographic School Bulletin,* Volume 47, No. 6, October 14, 1968. 10 cents. A report on the laboratory for housing the trio of astronauts after they returned from landing on the Moon, and the building where scientists make their first examinations of materials brought from the Moon. (I-U)

_____SOLAR STORMS SPARK MAJESTIC AURORAS. National Geographic Society. *National Geographic School Bulletin.* Volume 46, No. 17, January 22, 1968. 10 cents. Research on the aurora borealis, solar winds, and magnetic storms generated by the Sun. (I-U)

_____SPACE CAMERA CAPTURES NEAR EAST. National Geographic Society. *National Geographic School Bulletin.* Volume 46, No. 1, September 11, 1967. 10 cents. A color photograph made from the Gemini 4 spacecraft, showing a vast section of the Near East spanning nearly 1,000 miles. (I-U)

_____SPACE TEAM ZEROES IN ON MOON. National Geographic Society. *National Geographic School Bulletin.* Volume 47, No. 30, May 5, 1969. 10 cents. Describes the Apollo 10 flight to the Moon and its goals. (I-U)

National Science Foundation. SUMMER SCIENCE TRAINING PROGRAMS FOR HIGH-ABILITY SECONDARY SCHOOL STUDENTS. National Science Foundation. A brochure listing institutions conducting programs. List is available in January of each year. Free. (S)

National Science Teachers Association. A UNIVERSE TO EXPLORE. A Space Sciences Source Book for Junior High School Teachers. National Science Teachers Association, 139 p., illus., 1969. Available from the NEA Publications Sales Division. Paperback, $4. A joint project of the National Science Teachers Association and NASA. "A springboard for a study in depth of selected topics related to the space sciences." Topics include the Earth as a platform in space, astronomical measurement, solar cells, space environment, and simulation in the laboratory. The book also offers a section on student experiments, sources of information, and a bibliography. For the teacher. (A)

National Society of Professional Engineers. ENGINEERING—A CAREER OF OPPORTUNITY. National Society of Professional Engineers. A leaflet that helps students develop and answer questions about their own interest in and fitness for an engineering career. Free. (U-S)

Naturegraph Company. CONSTELLATION GAME. Naturegraph Company. A game for any number of players that teaches the positions of the constellations, major stars and planets. May be played while observing the sky. $1.25. (U-S-A)

Naugle, John E. UNMANNED SPACE FLIGHT. Holt, 160 p., illus., 1965. Paperback, $1.96. Discusses the scientific experiments carried on by instrumented unmanned satellites and space probes. (S)

Neal, Harry Edward. ENGINEERS UNLIMITED: Your Career in Engineering. Messner, 192 p., illus., rev. 1968. $3.95. Descriptions of opportunities in engineering including details on mechanical, chemical, metallurgical, electronic, aeronautical, and cryogenic engineering. Discusses types of problems faced by engineers in each of these and other engineering specialties, education and training required, and types of businesses and industries employing various types of engineers. (U-S)

Nehrich, Richard B., Jr., Glenn I. Voran and Norman F. Dessel. ATOMIC LIGHT: LASERS—What they are and how they work. Sterling, 104 p., illus., 1967. $4.95. Discusses various types of lasers and their applications and potentials. (S-A)

Newell, Homer E., Jr. SPACE BOOK FOR YOUNG PEOPLE. McGraw-Hill, 176 p., illus., rev. 1968. $4.95. An updated edition of an authoritative book about space exploration. Explains the solar system and its individual members, supplies the mathematics which is necessary for a real comprehension of space, distances, rocket speeds, etc., and examines discoveries obtained from scientific satellites. Emphasizes the mechanics of space flight. (I-U)

_____Henry J. Smith, Nancy G. Roman, and George E. Mueller. ASTRONOMY IN SPACE. #NAS 1.21:127. Supt. of Documents, 67 p., illus., 1967. Paperback, 45 cents. Information on current and prospective results of placing astronomical instruments above the Earth's atmosphere. Discusses solar astronomy, stellar and galactic astronomy, and opportunities for astronomical observations during manned space flight. Semi-technical. (S-A)

Nininger, H. H. A COMET STRIKES THE EARTH. American Meteorite Laboratory, 65 p., illus., rev. 1969. Paperback, $1.25. Basic information about meteorites—how to recognize them, the phenomenon of "fall," crater-forming meteorites, and the Arizona meteorite crater. Also includes a sample of oxidized meteorite. (S-A)

Norton, O. Richard. THE PLANETARIUM AND ATMOSPHERIUM. Naturegraph, 176 p., illus., 1967. $4.95. Paperback, $2.95. Includes an explanation of how a planetarium works, and tells about the difficulties encountered by its inventors. (S-A)

Odishaw, Hugh, editor. THE EARTH IN SPACE. Basic, 352 p., 1967. $6.95. A collection of articles by leading scientists that provides a "guided tour of this corner of the Milky Way." Summarizes present knowledge of the Earth, its cosmic environment, and other bodies in our solar system. (A)

Olney, Ross. AMERICANS IN SPACE. Nelson, 130 p., illus., rev. 1969. $3.50. A summary of advances in manned space flight in the U.S. with a look into the future. Includes accounts of Astronaut Shepard's flight in 1961 through manned flights terminating in the Moon landing July 1969. (U-S)

_____ASTRONOMY: The Inquiring Mind. Nelson, 192 p., illus., 1967. $3.50. An introduction to astronomy for the beginning amateur with emphasis on observational equipment and techniques. Useful information about observing the Moon is included. (I-U)

Packard, John W. and Hiram R. Haggett, project directors. AEROSPACE CURRICULUM RESOURCE GUIDE. #NAS 1.18:Ae8. Supt. of Documents, 197 p., illus., 1968. A guide for elementary and secondary school teachers representing a compilation of space-related information to parallel and reinforce the topics and concepts normally

taught, and to motivate teaching in every curriculum area. Suggests learning activities, reinforcement projects, references, and audio-visual resources. Covers the language arts, social studies, the fine arts, science, mathematics, industrial arts and career guidance. A "Teacher Education" appendix gives guidance in organizing in-service institutes and space science workshops to orient the teaching staff. Published in cooperation with the Massachusetts Department of Education. $1.75. (A)

Paul, Henry E. OUTER SPACE PHOTOGRAPHY FOR THE AMATEUR. Chilton, 3rd edition, 155 p., illus., 1967. $5.95. Covers astrophotography, from the simplest shots requiring basic tools to the most advanced, involving sophisticated equipment. Guidance about equipment, materials, and methods, plus color photography and the latest techniques. (S-A)

Perkins, Otho. EARTH AND SPACE SCIENCE SKILLCARDS. #1531. Merrill. A set of 72 Skillcards with individualized learning activities to introduce and/or reinforce basic concepts of space and Earth science such as the planets, satellites, the Moon, and Earth and its relationships in space. Each Skillcard includes five sections: 1) a statement of a scientific principle accompanied by a statement of the problem; 2) a list of required materials; 3) step-by-step procedures that lead the student to the solution of the problem; 4) questions leading to the results; and 5) the conclusion to the problem, which is printed on the back of the Skillcard to encourage the student to draw his own conclusion, and then compare it with given conclusion. $4. (U-S)

Pickering, James S. FAMOUS ASTRONOMERS. Dodd, 128 p., illus., 1968. $3.50. The lives and works of famous astronomers, including Copernicus, Tycho Brahe, Kepler, Galileo, Newton, and Herschel. (U-S)

———WINDOWS TO SPACE. Little, Brown, 224 p., illus., 1967. $4.75. A description of space as gathered by telescopes and radio astronomy. (S-A)

Pickering, William H. THE SEARCH FOR EXTRATERRESTRIAL LIFE. Jet Propulsion Laboratory. A reprint from the May 1967 issue of *Engineering and Science* outlining present plans and methods for investigating the possibilities of life on the planets and elsewhere in the universe outside our solar system. The role of spacecraft is emphasized. Free. (S-A)

Pierce, John R. THE BEGINNINGS OF SATELLITE COMMUNICATIONS. San Francisco Press, 61 p., illus., 1968. $2.75. A first-person account, tracing the evolution of satellite communications. The author is a foremost electronics engineer who figured in the earliest U.S. development of satellite communications. Arthur C. Clarke, noted British science-fiction writer who made the first proposal for synchronous satellites in 1945, contributes a preface. Clarke's original paper and the author's own 1955 proposal are included as Appendixes. (S-A)

Pike, Charles A. LASERS AND MASERS. Sams, 176 p., illus., 1967. Paperback, $4.95. Fundamentals of both gas and solid-state laser and maser devices, providing a useful background for understanding their applications to space age technology. Discusses principles, construction and operating characteristics. A semi-technical, programmed text. (S-A)

Pluimer, Harold P. THE FRONTIERS OF OUR TIME. Vantage, 98 p., illus., 1968. $3. An examination of the future as affected by the explosive growth of knowledge with its implications for the next generations. Flight in the atmosphere and in space is given appropriate consideration in this account of what the future may hold. (S-A)

Polgreen, John and Cathleen Polgreen. STARS TONIGHT. Harper, 96 p., illus., 1967. $3.95. A guide to the stars that helps locate their positions on charts for out-of-doors use. (S-A)

Pope, Billy N. and Ramona W. Emmons. LET'S VISIT A SPACESHIP. Taylor, 32 p., illus., 1968. $3.40. A picture story of three youngsters who visit the NASA Manned Spacecraft Center in Houston, Texas. Takes them through the step-by-step training of astronauts, the launching of a manned spacecraft, and its return from a successful mission. (P-I)

Porter, T. R., compiler. TEACHING TIPS FROM TST: Earth-Space Science. National Science Teachers Association, 121 p., illus., 1967. Available from NEA Publications Sales Division. Paperback, $4. A compilation of articles from *The Science Teacher* magazine dealing with Earth-space science. Titles of articles include "Satellite Orbits," "Signals from Space," "The Planetarium As An Educational Tool," and "Overhead Projection—Constellations." For the teacher. (A)

Prehoda, R. W. SOME MAJOR IMPACTS OF THE NATIONAL SPACE PROGRAM. #6. Public Health, Medicine, and Biological Research. Stanford Research Institute *Aerospace Systems Series,* Volume

6. 87 p., 1968. Available from Clearing House, #N68-34380. $3. Microfiche, 65 cents. Shows how manned space missions have involved intensive study of the normal healthy adult, while past medical research has concentrated on adults suffering from disease. Discusses the use of computers and mathematical modes for biological systems (now widely employed), and the "very serious time gap between the acceptance at the clinical testing level and the widespread distribution of the system in medicine where the user requirements are to be found." (A)

Pursell, Carroll W., Jr. ASTRONOMY IN AMERICA. Classroom Library Series. Rand McNally, 48 p., illus., 1967. Paperback, $1. Traces the history of astronomy in America from 1663 to the present. Describes the establishment of observatories, the building of modern telescopes, the use of planetariums, new developments in astronomy, the role of technology, and the goal of astronomy. Includes a chronology of events and a glossary. (U-S)

Quimby, F. H., editor. CONCEPTS FOR DETECTION OF EXTRATERRESTRIAL LIFE. #NAS 1.21:56. Supt. of Documents. A 53-page illustrated booklet discussing the devices and instruments planned for inclusion in vehicles designed to land on planets such as Mars. Describes techniques for detecting growth and metabolism, for determining the presence of biologically significant molecules, and for actual visual observation of microorganisms and the planetary terrain. 50 cents. (S-A)

Rabinowitch, Eugene and Richard S. Lewis, editors. MAN ON THE MOON: The Impact on Science, Technology, and International Cooperation. Basic, 240 p., illus., 1969. $5.95. A collection of views of noted scholars and scientists as to the effects that exploration of the Moon and space will have on life on Earth. A sampling of topics includes the impact of the Moon landing on the U.S.S.R., international cooperation, joint exploration of the Moon, the impact on the aerospace industry, and the future of man in space. (A)

Rackham, T. W. MOON IN FOCUS. Pergamon, 190 p., illus., 1968. Paperback, $3.25. A detailed analysis of the Moon—its surface and atmosphere—and what lunar space probes have revealed up through the flight of Lunar Orbiter 2. (S-A)

RCA. SPACE PROGRAMS. RCA. Booklet giving brief descriptions of many RCA projects contributing to manned and unmanned exploration of space. Free. (S-A)

Revell Educational Systems. PICTURE SET. #K7006. Revell Educational Systems. Eight 11" x 14" color and black-and-white photographs including views of the Earth from space, Astronaut White's walk in space, Moon craters, launching of the Saturn 5 rocket, etc. Explanations of the scenes, and sample questions for discussion or further research are printed on the back of each photograph. $8.50. (P-I-U-S)

Revell, Inc. APOLLO LUNAR MODULE MODEL KIT. #H-1842. Revell, Inc. 1/48th scale model, 5" high, with two astronaut figures, radio and radar antenna. Clear windows. $1.50. (I-U-S)

_____APOLLO LUNAR SPACECRAFT MODEL KIT. #H-1838. Revell, Inc. 1/48th scale, 20" high. Includes Command Module with detailed interior, Service Module, adapter section, launch escape system, Lunar Module with removable "ascent" and "descent" sections, and foldable legs. Clear plastic windows reveal interiors and three astronaut figures. Display stand. $6. (I-U-S)

_____APOLLO SPACECRAFT MODEL KIT. #H-1836. Revell, Inc. 1/96th scale with detachable Command and Service Modules, separable Lunar Module and display base. $1.50. (I-U-S)

_____GEMINI ASTRONAUT MODEL. #H-1837. Revell, Inc. Ready to assemble, 12" high. Includes pressure suit, flexible umbilical, movable face visor, camera and propulsion gun, chest pack, life support package, and display base. $2. (I-U-S)

_____GEMINI SPACE CAPSULE #H-1835. Revell, Inc. 1/24th scale, 9" tall. Ready to assemble, with display stand. Has removable equipment section and detachable retrograde package. Hatches open and close. Includes two astronaut figures. $3. (I-U-S)

_____MERCURY CAPSULE WITH REDSTONE BOOSTER. #H-1832. Revell, Inc. Model kit includes launching pad, retro-rockets, a three-man ground crew and factual booklet. Ready to assemble. $1.30. (U-S)

_____X-15 ROCKET PLANE model kit. #H-164. Revell, Inc. Easy to assemble, 9½" long, wingspan, 4". Movable vertical fin and dive brakes. Removable rocket engine and canopy section. Two-position landing skids. $1.30. (I-U-S)

Richey, B. J. APOLLO ASTRONAUTS: First Men to the Moon. Strode, 128 p., illus., 1969. $3.95. Biographies of the first astronauts to land on the Moon. The fourth volume in the "Heroes of Space" series. (U-S)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

_____THE ROCKET RESEARCH INSTITUTE, INC., ITS PROGRAMS AND POLICIES. Rocket Research Institute, Inc. A description of the purposes and activities of this non-profit, educational organization. 25 cents. (A)

_____ROCKET SAFETY EDUCATOR. Rocket Research Institute, Inc. A newsletter for those concerned with rocket safety education. Includes reports on current amateur projects, activities of amateur rocket groups, and safety suggestions. Published at irregular intervals. $3 for four issues. (S-A)

Ronan, Colin A. ASTRONOMERS ROYAL. Doubleday, 224 p., illus., 1967. $5.95. A history of astronomy in Great Britain from the time of Elizabeth I. Discusses the many contributions to astronomy made by British scientists. (S-A)

_____EDMOND HALLEY. Doubleday, 251 p., illus., 1969. $5.95. A biography of the discoverer of the comet which bears his name, and an extraordinary personality who contributed greatly to scientific knowledge during his life. (S-A)

Ross, David. SPACE CLUB MANUAL. Space Clubs of America, 100 p., illus., 1969. Paperback, $2.50. Suggestions for organizing and operating a Space Club under the Space Clubs of America. Complete information for adults who wish to organize a model rocket club. (A)

Ross, Frank, Jr. MODEL SATELLITES AND SPACECRAFT. Lothrop, 159 p., illus., 1969. $3.95. Discusses the history, purposes, and development of 12 unmanned American satellites. Also gives directions for making models of these satellites out of simple materials. Directions are full, and photographs of the original spacecraft, as well as the models made by the author, provide further assistance. Models may be displayed on stands or as mobiles. (U-S)

Ruggieri, Guido. SECRETS OF THE SKY. Golden Press, 174 p., illus., 1969. $5.95. Information about the Sun, the Moon, the solar system and the universe. Presents also a history of astronomical discoveries and contains a comprehensive appendix on space travel. (A)

Rule, Leonard. SPACE. Austin Lynn, 108 p., illus., 1967. $3.50. Brief sketches of five men who have contributed to the understanding of space: Newton, Einstein, Watson-Watt, Lovell, and Gagarin. (U-S)

Sawyer, Roger W. and Robert A. Farmer. NEW IDEAS FOR SCIENCE FAIR PROJECTS. Arco, 155 p., illus., 1967. $3.95. Advice about science fairs—how to choose a topic, how to plan for and display a project, judging procedures, research and construction, together with descriptions of prize winning projects presented by winning students. Several projects are related to space flight. (I-U-S)

Scholastic Book Services. THE PLAN TO SEND OUR MEN TO THE MOON—PROJECT APOLLO. Scholastic Book Services. A wall chart, approximately 30" x 40", in color, depicting the Project Apollo flight to the moon. A "See and Learn" chart with accompanying explanatory text and glossary. $1. (P)

_____PROJECT APOLLO—THE WAY TO THE MOON. Scholastic Book Services. A wall chart, approximately 30" x 40", in color, depicting the Project Apollo flight to the moon. An explanatory text and glossary accompany the chart. $1. (I)

Schure, Alexander. PROGRAMED LEARNERS. Cenco Educational Aids. "Teaching machines," each providing approximately 500 frames for self teaching. Programs are printed on a continuous roll in a small container with knobs for turning the roll.
Basic Astronomy. #58301-1. $2.95. (U-S)
Makeup of the Universe. #58301-2. $2.95. (U-S)
Solar System. #58301-3. $2.95. (U-S)
The Sun. #58301-4. $2.95. (U-S)

Schwartz, Ira R. SECOND CONFERENCE ON SONIC BOOM RESEARCH. #NAS 1.21:180. Supt. of Documents, 193 p., illus., 1968. Paperback, $1. Proceedings of a conference to review the current status of sonic boom research at universities and NASA centers, to determine the most pressing areas of research related to the supersonic transport (SST) and to discuss the most promising avenues of research regarding the reduction of sonic boom overpressure. Semi-technical. (A)

Science Experimenter, see Editors of Science Experimenter.

Science Research Associates. AEROSPACE ENGINEERS. #201. Science Research Associates. An occupational brief that discusses the various engineering specialties in the aerospace industry, requirements, how to get started in the profession, and the future outlook for aerospace engineering. 45 cents. (S)

_____AEROSPACE INDUSTRIES MANUFACTURING WORKERS. #81. Science Research Associates. Discusses briefly the growth of the aerospace industry, and its character today, what kinds of workers are employed, general requirements and training, earnings, and working conditions of the industry, and also its future. 45 cents. (S)

_____AEROSPACE TECHNICIANS. #381. Science Research Associates. An occupational brief giving the history of the occupation and detailing the work categories, working conditions, requirements, preparation, earnings and outlook for the future. 45 cents. (S)

_____ASTRONOMERS. #213. Science Research Associates. A 4-page occupational brief discussing the work of an astronomer, training and qualifications, salaries and benefits, how to get started, and outlook for the future. 45 cents. (S)

_____CHEMICAL TECHNICIANS. #318. Science Research Associates. A 4-page occupational brief discussing the work of a chemical technician, training, qualifications, requirements, salaries and benefits, and outlook for the future. 45 cents. (S)

_____DATA-PROCESSING MACHINE OPERATORS. #322. Science Research Associates. Occupational brief. 45 cents. (S)

_____DRAFTSMEN. #33. Science Research Associates. A 4-page occupations brief discussing drafting specialties, requirements, training, getting started, opportunities for advancement, hours and earnings, and outlook for the future. 45 cents. (S)

_____ELECTRICAL ENGINEERS. #3. Science Research Associates. Occupational brief. 45 cents. (S)

_____JOBS IN ELECTRONIC DATA PROCESSING. Job Family Booklet #20. Science Research Associates. $1.55. (S)

_____JOBS IN ENGINEERING. Job Family Booklet #7. Science Research Associates. $1.55. (S)

_____JOBS IN MATHEMATICS. Job Family Booklet #8. Science Research Associates. $1.55. (S)

_____JOBS IN MECHANICAL WORK. Job Family Booklet #2. Science Research Associates. $1.55. (S)

_____JOBS IN SCIENCE. Job Family Booklet #1. Science Research Associates. $1.55. (S)

_____JOBS IN TECHNICAL WORK. Job Family Booklet #4. Science Research Associates. $1.55. (S)

_____MECHANICAL ENGINEERS. #4. Science Research Associates. A 4-page occupational brief discussing mechanical engineering specialities, qualifications and requirements, training, opportunities for advancement, salaries and benefits, and outlook for the future. 45 cents. (S)

_____PROGRAMMERS. #281. Science Research Associates. Occupational brief. 45 cents. (S)

_____SYSTEMS ANALYSTS. #357. Science Research Associates. Occupational brief. 45 cents. (S)

_____TECHNICAL WRITERS. #286. Science Research Associates. Occupational brief. 45 cents. (S)

Scull, J. R. SPACE TECHNOLOGY. Volume IV. Spacecraft Guidance. #NAS 1.21:68. Supt. of Documents, 143 p., illus., 1967. Paperback, 55 cents. A basic text for upper-level college engineering students discussing tradeoffs among injection, midcourse, and terminal guidance, and ways of mechanizing systems. (A)

Seamans, Robert C., Jr. ACTION AND REACTION. Massachusetts Institute of Technology with the American Institute of Aeronautics and Astronautics, 106 p., illus., 1969. Available from the M. I. T. Press. Write for price. The 1969 Minta Martin Lecture in which the author, a former NASA administrator, describes the origin and development of the U.S. space program. Using his personal records, the author analyzes the processes of decision-making and implementation involved in the commitment to a manned lunar landing. He discusses the concept of a goal-oriented and "action" program and the competitive and cooperative aspects of space exploration. A framework for evaluation of research and development programs is developed and is then applied to the nation's space program. (A)

Seebass, A. R., editor. SONIC BOOM RESEARCH. #NAS 1.21:147. Supt. of Documents, 118 p., illus., 1968. Paperback, 50 cents. Five papers presented at a conference held in Washington, D.C. April 1967 on the generation and propagation of sonic booms. Considers basic theories, the effects of airplane operations and the atmosphere on sonic booms, and the effects of sonic booms on people and structures. Semi-technical. (S-A)

Seligsohn, I. J. YOUR CAREER IN COMPUTER PROGRAMMING. Messner, 222 p., illus., 1967. $3.95. An insight into computers and computer programming, emphasizing the personal and educational requirements for the job of computer programmer, and its relation to space technology. Cites success stories of people working in this career field and includes a bibliography and sources of further information. (S)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

Sells, S. B., editor. CONFERENCE ON SOCIAL-BEHAVIORAL PROBLEMS OF LONG-DURATION SPACE MISSIONS. Institute of Behavioral Research, Texas Christian University, 77 p., 1967. 50 cents for postage and handling. An edited transcript of a two-day discussion held at Texas Christian University December 1966. Participants, who were psychiatrists, psychologists, sociologists, and historians, considered diet, relief of boredom, personal privacy, illness, death, flow of information, sharing of housekeeping and maintenance duties, and other social-behavioral aspects of long term space flight. (A)

Senate, see U.S. Senate.

Sharpe, Mitchell R. LIVING IN SPACE: The Astronaut and His Environment. Doubleday, 192 p., illus., 1969. Paperback, $2.45. A book in the *Doubleday Science Series* discussing the physical hazards of space, human response to space conditions, simulating space conditions, maintaining life in space, medical "spin-offs" from manned space flight, telemetry, astronaut training, and many other bio-astronautical subjects. (S-A)

_____YURI GAGARIN: First Man in Space. Strode, 128 p., illus., 1969. $3.95. A profusely illustrated biography of the Soviet space pioneer. The second book in the series "Heroes of Space." (U-S)

Sheldon, Charles S. II. REVIEW OF THE SOVIET SPACE PROGRAM, With Comparative United States Data. McGraw-Hill, 152 p., illus., 1968. $9.95. The results of a ten-year study of the Soviet space program compared with corresponding U.S. space programs based on unclassified flight data published by Western sources, Soviet announcements, and data derived from U.S. observational equipment. Soviet launch vehicles and launch sites are examined and contrasted with their U.S. counterparts. Also includes drawings of Soviet launch vehicles and spacecraft and discusses Soviet space plans, the "space race" and space goals of both the Russians and Americans. (S-A)

Shelton, William R. AMERICAN SPACE EXPLORATION: The First Decade. Little, Brown, 320 p., illus., 1967. $5.95. The story of the first ten years of U.S. exploration of space, from the first launchings at Cape Canaveral in the mid-1950's to early stages of Project Apollo. Based on the author's experiences during numerous launchings and interviews with astronauts, ground crews, military personnel and scientists and engineers involved in the nation's space program. (S-A)

_____MAN'S CONQUEST OF SPACE. National Geographic Society, 200 p., illus., 1968. $4.25, plus 40 cents postage and handling. Describes man's earliest dreams of travel in space, and the milestones of the first decade in space. Covers manned space flight, as well as unmanned satellites and space probes, illustrated with color photographs and paintings. (U-S-A)

_____SOVIET SPACE EXPLORATION: The First Decade. Washington Square Press, 339 p., illus., 1968. Available from Simon and Schuster. $6.95. An account of all phases of the Soviet space effort from early research to manned launchings and planetary probes. Also considers the Russian cosmonauts, the contributions of pioneering Konstantin Tsiolkovsky, and "chief designer," Sergei Korolev. (A)

Silverberg, Robert. FOUR MEN WHO CHANGED THE UNIVERSE. Putnam, 256 p., 1968. $3.49. The story of four pioneer scientists—Copernicus, Tycho Brahe, Kepler, and Galileo—who contributed most to our understanding of the universe, and how the scientists that followed these pioneers built on their contributions. (U-S)

_____THE WORLD OF SPACE. Meredith, 166 p., illus., 1969. $3.95. The story of man's efforts to travel into space. Includes descriptions of lunar conditions and environments of all the planets. Discusses the possibilities of extraterrestrial life. (U-S)

Singer, S. Fred, editor. THE PHYSICS OF THE MOON. Volume 13, Science and Technology series. American Astronautical Society, 260 p., illus., 1967. $12.75. Based on papers presented at a symposium held December 1966 in Washington, D.C. Panel members discussed the Moon's surface and interior, optical properties, lunar photography, thermal history, lunar origin, gravity, and many other related topics. Data discussed included those received from Lunar Orbiter and Surveyor experiments. (S-A)

Slote, Alfred. MOON IN FACT AND FANCY. World, 127 p., illus., 1967. $3.95. Folk tales about the Moon's mysteries are used as springboards from which scientific facts leading up to the Surveyor and Apollo missions are described. (I-U)

Smith, S. W., editor. A HANDBOOK OF ASTRONAUTICS. British Interplanetary Society, 128 p., illus., U.S. edition, 1969. Available from Dufour Editions. $5. An American edition of a British book first published in 1963, for use in British schools. While some of the material is not up to date, it considers many still timely topics such as space dynamics, the mathematics of space flight, space navigation, Earth-Moon system, etc. The book is

designed to relate astronautics to subjects in the high school curriculum. (S)

Smithline, Frederick. ANSWERS ABOUT THE MOON, STARS, AND PLANETS. Grosset, 64 p., illus., 1969. $1.95. Pictures and diagrams aid in answering children's questions about the solar system, planets, eclipses, meteors, the Sun, gravity, and other phenomena of our universe. (I-U)

Smithsonian Astrophysical Observatory. SPACE SCIENCES AND SATELLITE TRACKING AT THE SMITHSONIAN. Smithsonian Astrophysical Observatory. A 6-page review of the history of the Smithsonian Astrophysical Observatory's part in the nation's satellite tracking program, plus a description of the Observatory's research program in astrophysics. Free. (S-A)

Smithsonian Institution. COMMUNICATIONS IN SPACE. Smithsonian Institution Press. An illustrated booklet giving brief explanations of various kinds of communications satellites—Echo, Syncom, Telstar, Relay, Comsat, and others—emphasizing their differences and uses. 50 cents. (U-S-A)

_____MASTERS OF SPACE. Smithsonian Institution Press. An illustrated 32-page booklet giving the highlights of the development of rocketry and our space program. 50 cents. (I-U-S)

_____TRAINING BY SIMULATION. Smithsonian Institution Press. A booklet presenting the 1964 Edwin A. Link Lecture given by Astronaut Alan B. Shepard, Jr. Discusses the numerous kinds of simulators and their uses in preparing man for flight in space. 50 cents. (S-A)

Society for Visual Education. THE ASTRONAUT—TRAINING AND EQUIPMENT. #SP-155. Society for Visual Education. Eight full color study prints, 18" x 13" covering zero gravity, suiting up, manned altitude test, wet mock, fit and function, man and equipment test, and man on the Moon. Reverse side includes suggestions for use, explanations of pictures, and questions for discussion. Also includes a list of related SVE filmstrips. $8 per set. (I-U-S)

_____BUILDING TOWARD THE MOON. #SP-158. Society for Visual Education. Eight study prints, 18" x 13", in color, depicting a capsule heat-cold test, the manufacture of the Apollo spacecraft, testing the Lunar Module, transporting the booster rocket, Cape Kennedy, the readying, roll-out and lift-off of the Apollo spacecraft. Details on back of each print. $8 per set. (I-U-S)

_____COUNTDOWN TO SPLASHDOWN. #SP-156. Society for Visual Education. Eight full color study prints, 18" x 13", covering mission control, docking maneuvers, space walk, rendezvous, frogman, and recovery procedures with arrival on the aircraft carrier. Reverse side includes suggestions for use, explanations of pictures, and questions for discussion, plus a list of related SVE filmstrips. $8 per set. (I-U-S)

_____GEOGRAPHY FROM SPACE. #SP-157. Society for Visual Education. Eight full color study prints, 18" x 13", including pictures of Earth taken from orbiting satellites. Shows Moon and Earth, Red Sea and the Nile River, a storm off Morocco, the Nile Delta, South India, the Gulf of California, and numerous other Earth features. Reverse side lists suggestions for use, gives explanations of pictures and presents questions for discussion. Also lists related SVE filmstrips. $8 per set. (I-U-S)

Sparks, James C. WINGED ROCKETRY. Dodd, 183 p., illus., 1968. $4.50. A history of rocket planes from the first crude version in ancient China to the barrier-breaking rocket planes of the U.S. Also projects into spacecraft of the future, capable of piloted flight into and back from orbit, for global travel, transportation of cargo, etc. (U-S)

Splaver, Sarah. SOME DAY I'LL BE AN AEROSPACE ENGINEER. Hawthorn, 96 p., illus., 1967. $3.75. Describes the history of the aerospace engineering profession, personal characteristics considered desirable, education and training needed, the work performed and advantages of this career. (I-U)

Stern, Phillip D. OUR SPACE ENVIRONMENT. Holt, 160 p., illus., 1965. Paperback, $1.96. A guide to the planets, comets, and stars. Discusses facts and theories about the universe resulting from the exploration of space. (S)

Stiffler, J. J. SPACE TECHNOLOGY. Volume V: Telecommunications. #NAS 1.21:69. Supt. of Documents, 142 p., illus., 1967. Paperback, 55 cents. A basic text for upper-level college engineering students discussing fundamentals, modulation, data compression, and systems in use and planned. (A)

Stine, G. Harry. A HANDBOOK OF MODEL ROCKETRY. Follett, 304 p., illus., rev. 1967. $6.95. Paperback, $4.95. A comprehensive book about how to safely build and launch model rockets, including calculations for designing, tracking, etc. Also accurate descriptions of materials and methods, and information on organizing a model rock-

etry club that can be affiliated with the National Association of Rocketry. (U-S-A)

Strafford Industries. MAP OF THE MOON. Strafford Industries. 35" x 45", black and white, with 600 named lunar features indexed for easy location. Lunar features such as craters, mountains, rills, rays, and seas are readily identified. $1. (P-I-U-S-A)

Strickler, Mervin K., Jr., editor. AN INTRODUCTION TO AEROSPACE EDUCATION. Times Mirror School and Library Service, 336 p., illus., 1968. $4.95. Discusses the many phases and approaches of aerospace education and answers "how to start," "what to do," and "where to get" questions for those who are developing courses in aviation and space education, or who are searching for new materials and techniques to enrich regular classroom instruction in most subjects and at all grade levels. Includes an extensive bibliography and descriptions of actual classroom units and courses. May also be used as a teacher's guide for the 14-volume *ABOVE AND BEYOND—The Encyclopedia of Aviation and Space Sciences.* For the teacher. (A)

Sutton, Felix. HOW AND WHY WONDER BOOK OF THE MOON. Grosset, 48 p., illus., rev. 1969. $1.25. Paperback, 59 cents. Many facts about the Moon for the young reader—size, distance, theories about its origin, and many other bits of information to develop understandings about Moon exploration. (I-U)

_____and Alvin Maurer. CONQUEST OF THE MOON. Grosset, 64 p., illus., 1969. $1.95. Paperback, $1. The story of the conquest of the Moon, from the time when men first began to dream about visiting it through the complete story of the historic Apollo 11 flight. (I-U)

Sutton, Richard M. THE PHYSICS OF SPACE. Holt, 176 p., illus., 1965. Paperback, $1.96. Space science and its relationship to the study of physics are discussed. Explains the nature and structure of the universe and some of the discoveries revealed by spacecraft and space probes. (S)

Taylor, L. B., Jr. LIFTOFF! The Story of America's Spaceport. Dutton, 319 p., illus., 1968. $7.50. A history of the nation's spaceport from its beginning in 1949 as Cape Canaveral. Describes its transformation into a major space facility as the Kennedy Space Center. (S-A)

Teachers Publishing Corporation. SPACE. #20034. Teachers Publishing Corporation. Volume 6 in the "Investigating Science With Children" series. A 90-page illustrated handbook for the teaching of intermediate grade science, prepared under the sponsorship of the National Science Teachers Association and NASA. Helps teachers incorporate space science into the science curriculum. Suggests almost 80 activities to help children understand scientific principles related to space travel: space navigation, rocketry, spacecraft guidance, life support systems, and many other subjects. Revised and updated 1968. Paperback, $2.75. (A)

Tharp, Edgar. GIANTS OF SPACE. Grosset, 128 p., illus., 1968. $3.95. A collection of sketches of astronauts and cosmonauts giving brief background information and recollecting their significant moments in space. Also considers how satellites serve men, and provides logs of manned space flights, major unmanned satellites, and space probes. (I-U)

Thomas, Shirley. MEN OF SPACE. Volume 8. Chilton, 235 p., illus., 1968. $7.95. Profiles of ten men who are shaping the space age: Miller, Cannon, Emme, Fulton, McFarland, Merrill, Pace, Sheldon, Sorenson, and Symington. Volume 8 also includes an index to all eight volumes (1960-1968) in the series which covers the backgrounds and contributions of 80 outstanding leaders in the development of space exploration in the U.S. and Europe. Complete set of eight volumes, $49.95. (S-A)

Times Mirror School and Library Service. STUDY PRINTS. Times Mirror School and Library Service. Color, 13" x 15". A set of 14 depicts a space walk, launch pad, supersonic jets flying in formation, floatplane, balloon, helicopter, aerial refueling, sailplane, aircraft for short runways, charting the Moon, Project Vela: Space Sensor, the supersonic transport (SST), exploring the universe, and jet flight simulation. $9.95 per set, or $1 each with a minimum order of five prints. (P-I-U)

Tricker, R. A. R. THE PATHS OF THE PLANETS. American Elsevier, 235 p., 1967. $9.50. Designed to help the reader pursue the study of the solar system on a "do it yourself" basis. Only a simple telescope is required and a minimum of mathematical knowledge. Considers orbits of the planets, the Moon, gravitation, and many other topics of interest to the amateur astronomer. (S-A)

TRW Systems Group. INTELSAT III WALL CHART. TRW Systems Group. 28" x 45" in color, two sides. Describes communications satellite system and subsystem operation and performance, including such topics as orbital deployment, frequency allocation, and ground stations. Shows graphically

how synchronous communications satellites work. $3.95. (U-S-A)

Tudor Publishing Company. SPACE AGE. Tudor Publishing Company. A poster, in color, 25" x 35", depicting artists' versions of spacecraft and rockets of the future. $1. (I-U-S)

United Nations. SPACE SCIENCE AND TECHNOLOGY: BENEFITS TO DEVELOPING COUNTRIES. United Nations, 1968. Paperback, $1. Explores the benefits to emerging nations coming from space science and technology. A publication reporting on the United Nations Conference on the Exploration and Peaceful Uses of Space. (S-A)

United Nations Educational, Scientific and Cultural Organization. COMMUNICATION IN THE SPACE AGE—THE USE OF SATELLITES BY THE MASS MEDIA. UNESCO, 200 p., 1968. Available from UNIPUB. Paperback, $4. Experts in the broad range of fields involved in the development of space communication give their views on the long-term programs necessary to promote the use of space communication as a means for the free flow of information, the spread of education, and wider international cultural exchanges. Based on papers presented at a UNESCO meeting in Paris in 1965. Examines the roles of space satellites in enhancing the power of the mass media to reach and influence vast audiences. (A)

_____COMMUNICATION SATELLITES FOR EDUCATION, SCIENCE AND CULTURE. #53. United Nations Educational, Scientific, and Cultural Organization. A 23-page booklet focusing on the international problems of bringing communication satellites into use to serve the objectives of education, science, and culture. Available from UNIPUB. $1. (A)

U.S. Atomic Energy Commission. SOVIET SPACE PROGRAMS, 1962-1965; Goals and Purposes, Achievements, Plans, and International Implications. #Y 4.AE 8:So 8/962-65. Supt. of Documents, 920 p., illus., 1967. $2.75. A report on Soviet space activities through 1965. Considers also their effect on international relations. (S-A)

U.S. Department of Commerce. MODERNIZED METRIC SYSTEM, THE. #C13.10:304. Supt. of Documents. A 45" x 29" full-color chart issued by the National Bureau of Standards, depicting the six base units of measurement (length, time, mass, temperature, electric current, and luminous intensity) and giving their definitions, abbreviations, and some International System of Units derived from them. 50 cents. (S-A)

_____Environmental Science Services Administration. EMPLOYMENT OPPORTUNITIES IN DYNAMIC METEOROLOGY AND APPLIED MATHEMATICS. #ESSA/PI 670023. U.S. Department of Commerce, Environmental Sciences Services Administration. Leaflet describing opportunities with the National Environmental Satellite Center. Free. (S-A)

_____Environmental Science Services Administration. MAN'S GEOPHYSICAL ENVIRONMENT: ITS STUDY FROM SPACE. #C52.2:G29/2. Supt. of Documents, 147 p., 1968. $2. A report to the Administrator of ESSA prepared by a Special Task Force of the ESSA under the chairmanship of Dr. J. P. Kuettner. Considers contributions of satellites to knowledge of radio propagation, meteorology, hydrology, oceanography, geodesy, seismology, and geomagnetism. Appraises the potential uses of manned and unmanned space platforms for the environmental sciences, technical feasibility, available hardware, and multipurpose use of data. (S-A)

U.S. Department of Defense. LUNAR CHARTS. #D 301.49/4: Supt. of Documents. U.S. Air Force charts of the Moon. A series of charts and mosaic charts of the areas of the Moon observable from Earth. Write for details and prices. (S-A)

_____LUNAR FARSIDE CHARTS. #D 301.49/4: LFC-1/967-2 and #D 301.49/4: LFC-2. Supt. of Documents. Two U.S. Air Force charts covering the far side of the Moon prepared from photographs taken by the USA Lunar Orbiters and the USSR Zond III. Write for details and prices. (S-A)

_____MARINER 69 MARS CHART. #D 301.49/4:MEC-2. Supt. of Documents. 30" x 35". 1967. Scale: 1:25,000,000 at Equator. 35 cents. (U-S-A)

U.S. Department of Health, Education and Welfare. AIDS FOR MATHEMATICS EDUCATION: SPACE-ORIENTED MATHEMATICS FOR EARLY ELEMENTARY GRADES. #FS 5.229:29058. Circular #741. Supt. of Documents. 30 cents. (A)

U.S. Department of Labor. EMPLOYMENT OUTLOOK FOR AIRCRAFT, MISSILES, AND SPACECRAFT MANUFACTURING OCCUPATIONS. #L 2.3:1550-96. Supt. of Documents. A leaflet giving a brief description of jobs related to the subject areas, plus an evaluation of the future status of the occupations. 10 cents. (U-S-A)

_____EMPLOYMENT OUTLOOK FOR BIOLOGICAL SCIENTISTS. #L 2.3:1550-8. Supt. of Documents. 5 cents. (S)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

_____EMPLOYMENT OUTLOOK FOR EARTH SCIENTISTS: GEOLOGISTS, GEOPHYSICISTS, METEOROLOGISTS, OCEANOGRAPHERS. #L 2.3:1550-29. Supt. of Documents. 10 cents. (S)

_____EMPLOYMENT OUTLOOK FOR ELECTRONIC COMPUTER OPERATING PERSONNEL, PROGRAMMERS. #L 2.3:1550-32. Supt. of Documents. 10 cents. (S)

_____EMPLOYMENT OUTLOOK FOR ENGINEERS: AEROSPACE, AGRICULTURAL, CERAMIC, CHEMICAL, CIVIL, ELECTRICAL, INDUSTRIAL, MECHANICAL, METALLURGICAL, MINING. #L 2.3:1550-33. Supt. of Documents. 10 cents. (S)

_____EMPLOYMENT OUTLOOK FOR MATHEMATICS AND RELATED FIELDS: MATHEMATICIANS, STATISTICIANS, ACTUARIES. #L 2.3:1550-49. Supt. of Documents. 10 cents. (S)

_____EMPLOYMENT OUTLOOK FOR PHYSICAL SCIENTISTS: CHEMISTS, PHYSICISTS, ASTRONOMERS. #L 2.3:1550-65. Supt. of Documents. 10 cents. (S)

_____EMPLOYMENT OUTLOOK FOR TECHNICAL WRITERS. #L 2.3:1550-54. Supt. of Documents. 5 cents. (S)

_____EMPLOYMENT OUTLOOK FOR TECHNICIANS: ENGINEERING AND SCIENCE TECHNICIANS, DRAFTSMEN. #L 2.3:1550-88. Supt. of Documents. 10 cents. (S)

U. S. House of Representatives. Committee on Science and Astronautics. AERONAUTICAL RESEARCH AND DEVELOPMENT. U. S. House of Representatives, Committee on Science and Astronautics. 90th Congress, 2nd session. Committee Print #10. September 24-October 3, 1968. Free. Hearings before the Subcommittee on Advanced Research and Technology of the Committee on Science and Astronautics. (A)

_____Committee on Science and Astronautics. REVIEW OF THE SOVIET SPACE PROGRAM WITH COMPARATIVE UNITED STATES DATA. Supt. of Documents. 138 p., illus., 1967. *Out of print.* (A)

_____Committee on Science and Astronautics. A SUMMARY of the results of 449 responses to a space program questionnaire sent by Representative Olin E. Teague to the 750 top industrial firms listed by *Fortune*. U. S. House of Representatives. Committee on Science and Astronautics. Free. (A)

U. S. National Aeronautics and Space Administration. AMERICA IN SPACE: THE FIRST DECADE. Supt. of Documents, 1969. A series of illustrated booklets published in recognition of NASA's tenth anniversary; see individual listings for annotations. Titles of booklets are:

SPACE PHYSICS AND ASTRONOMY. #NAS 1.19:51. 45 cents. (S-A)

EXPLORING THE MOON AND PLANETS. #NAS 1.19:52. 50 cents. (S-A)

PUTTING SATELLITES TO WORK. #NAS 1.19:53. 50 cents. (S-A)

NASA SPACECRAFT. #NAS 1.19:54. 50 cents. (S-A)

SPACECRAFT TRACKING. #NAS 1.19:55. 40 cents. (S-A)

LINKING MAN AND SPACECRAFT. #NAS 1.19:56. 40 cents. (S-A)

MAN IN SPACE. #NAS 1.19:57, 55 cents. (S-A)

_____APOLLO 8, MAN AROUND THE MOON. #NAS 1.19:66. Supt. of Documents, 26 p., illus., 1969. 50 cents. A report on the Apollo 8 flight around the Moon by Astronauts Borman, Lovell and Anders. (U-S-A)

_____APOLLO 11: PRELIMINARY SCIENCE REPORT. #N70-10030, Clearing House, 204 p., illus., 1969. $3. A preliminary report on scientific results, including a photographic summary, crew observations, lunar samples (rocks), the passive seismic experiment, laser ranging retro reflector, solar wind composition, lunar surface closeup stereoscopic photography and modified dust detector.

_____BATTERIES FOR SPACE POWER SYSTEMS. #NAS 1.21:172. Supt. of Documents, 305 p., illus., 1968. Paperback, $1.50. A review of the principles of battery operation, and the state of the art. Considers batteries for low and high temperature operation such as silver zinc, lead acid, and nickel cadmium batteries. Semi-technical. (S-A)

_____BIOSATELLITE II. NASA FACTS. #NAS 1.20:NF-3. Supt. of Documents, 12 p., illus., 1969. 35 cents. A description of biology experiments in an orbiting spacecraft to study the effects of radiation and weightlessness on specimens of plants, seedlings, bread mold, insects, frog eggs, and other forms of life. (U-S-A)

_____CODE NAME: SPIDER, Flight of Apollo 9. #NAS 1.19:68. Supt. of Documents, 18 p., illus., 1969. 40 cents. The flight of Apollo 9 in which the first manned flight test of the lunar module (LM) was successfully attempted, is reported in full color. (U-S-A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

_____COUNTDOWN. NASA FACTS, Science Series #NAS 1.20:NF-4. 4 p., illus., 1967. 5 cents. Describes the activities and preparations that take place before, during, and immediately after the launching of a spacecraft. (I-U)

_____ELECTRIC POWER GENERATION IN SPACE. NASA FACTS #NAS 1.20:NF-38. Supt. of Documents, 20 p., illus., 1968. 20 cents. A discussion of the sources of power for spacecraft. Describes power sources for instruments, radio, environment control, and other purposes. (S-A)

_____EXPLORER XXIX (THE GEODETIC EXPLORER). NASA FACTS #NAS 1.20:3/4. Supt. of Documents, 20 p., illus., 1968. 20 cents. A description of the role of Explorer XXIX in discovering new information about our planet Earth, and the use of satellites in geodesy. (S-A)

_____EXPLORING THE MOON AND PLANETS. #NAS 1.19:51. Supt. of Documents, 26 p., illus., 1969. 50 cents. A summary of the lunar space probe program (Ranger, Lunar Orbiter and Surveyor spacecraft) and the exploration of Mars and Venus by Mariner spacecraft. (S-A)

_____FIFTY YEARS OF AERONAUTICAL RESEARCH. #NAS 1.19:45. Supt. of Documents, 71 p., illus., 1968. 55 cents. A chronological account of the most significant aeronautical research projects undertaken by the National Advisory Committee for Aeronautics and its successor organization, NASA, from 1917 through 1967. The contributions and scientific breakthroughs of both NACA and NASA engineers and scientists leading to the growth and superior position of U. S. aviation are traced. (S-A)

_____FOOD FOR SPACE FLIGHT. NASA FACTS #NAS 1.20:NF-41. Supt. of Documents, 8 p., illus., 1968. 20 cents. The storing and eating of nutritious and tasty space food in the space environment. (P-I-U-S-A)

_____FROM HERE, WHERE? A SPACE MATHEMATICS SUPPLEMENT FOR SECONDARY LEVELS. #NAS 1.2:F 92. Supt. of Documents, 1965. 192 p., illus. $1.25. (A)

_____GEMINI PICTORIAL. NASA FACTS #NAS 1.20:NF-40. Supt. of Documents, wall sheet, illus., 1966. An account of the Gemini program, with color photographs of Earth taken from Gemini spacecraft. (P-I-U-S-A)

_____"IN THIS DECADE. . . ." MISSION TO THE MOON. #NAS 1.19:71. Supt. of Documents, 20 p., illus., 1969. $1.25. A booklet outlining the complex steps leading to a manned lunar landing. The many and varied areas of research and development conducted by NASA are illustrated. In color. (U-S-A)

_____INTRODUCING CHILDREN TO SPACE, THE LINCOLN PLAN. #NAS 1.19:36. Supt. of Documents, 168 p., 1966. A handbook developed, with support from NASA, by teachers in the Lincoln, Nebraska Public Schools to integrate aerospace education concepts into the elementary school curricula. Suggests instructional materials and activities, and relates them to content areas. $1.25. (A)

_____JOURNEY TO THE MOON. NASA FACTS #NAS 1.20:NF-40. Supt. of Documents, wall sheet, illus., 1968. 30 cents. A color wall sheet depicting manned space flight to the Moon, including landing on the Moon, rejoining the Apollo spacecraft, and the return to Earth. (P-I-U-S-A)

_____LEARNING ABOUT SPACE CAREERS. #NAS 1.19:32. Supt. of Documents, 24 p., illus., 1966. 25 cents. A booklet providing ideas and suggestions to help upper elementary students determine career choices. Includes information about the space industry. (I-U)

_____LIFE SCIENCE IN A SPACE AGE SETTING. U. S. National Aeronautics and Space Administration. 313 p., illus., 1968. A guide for teachers at the upper elementary through junior high school level, prepared at a workshop conducted by the Wayne State University. A report submitted to NASA. Available from NASA. (A)

_____LIFTING BODIES. NASA FACTS #NAS 1.20:4/2. Supt. of Documents, 8 p., illus., 1967. 10 cents. Describes the design, testing and flying of powered and unpowered lifting bodies, including a brief technical and illustrated description of types of lifting bodies. (S-A)

_____LINKING MAN AND SPACECRAFT. #NAS 1.19:56. Supt. of Documents, 18 p., illus., 1969. 40 cents. A booklet explaining the communications systems that exist between the ground and every rocket or spacecraft traveling in space. (S-A)

_____LIVING IN SPACE. NASA FACTS #NAS 1.20:27. Supt. of Documents, 12 p., illus., 1966. 20 cents. A description of the ingenious life support systems devised by science and industry to enable spacecraft crews to remain in space for extended periods of time in an Earth-like environment. (U-S-A)

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_____LOG OF APOLLO 11. #NAS 1.19:72. Supt. of Documents, 12 p., illus., 1969. 35 cents. A booklet, in color, documenting the greatest voyage in the history of mankind—the journey to the Moon of Apollo 11. (U-S-A)

_____LUNAR ORBITER. NASA FACTS #NAS 1.20:4/4. Supt. of Documents, 12 p., illus., 1967. 15 cents. A description of the unmanned Lunar Orbiter spacecraft which have transmitted spectacular photographs of the Moon taken from lunar orbits. (I-U-S-A)

_____MAN IN SPACE. #NAS 1.19:57. Supt. of Documents, 30 p., illus., 1969. 55 cents. A booklet presenting the story of Projects Mercury and Gemini and preparation for Apollo. (U-S-A)

_____MANNED SPACE FLIGHT (APOLLO). NASA FACTS #NAS 1.20:NF-23. Supt. of Documents, 16 p., illus., 1969. 20 cents. A booklet describing plans for the Apollo program. Shows the Saturn V launch vehicle, the Apollo spacecraft, and the Lunar Module. (U-S-A)

_____MANNED SPACE FLIGHT (MERCURY AND GEMINI). NASA FACTS #NAS 1.20:2/8/rev.-2. Supt. of Documents, 12 p., illus., 1967. 15 cents. A summary of the successfully concluded Projects Mercury and Gemini, forerunners of the Apollo manned space flights. (U-S-A)

_____MARINER-MARS 1964, FINAL PROJECT REPORT. #NAS 1.21:139. Supt. of Documents, 346 p., illus., 1968. Paperback, $2.50. A summary of the Mariner spacecraft investigations of the planet Mars. (S-A)

_____MARINER SPACECRAFT. NASA FACTS #NAS 1.20:NF-39. Supt. of Documents, 12 p., illus., 1968. 15 cents. The Mariner V findings from the Venus fly-by and the Mariner IV Mars experiment. (S-A)

_____MEDICAL BENEFITS FROM SPACE RESEARCH. #NAS 1.19:46. Supt. of Documents, 16 p., illus., 1968. 30 cents. A booklet presenting examples of the ways in which research discoveries and engineering innovations coming from the nation's space program have been applied to major medical problems. (U-S-A)

_____MISSION REPORT/APOLLO 10. #NAS 1.19:70. Supt. of Documents, 12 p., illus., 1969. 35 cents. A booklet, in color, presenting the final "full-dress rehearsal" for a manned lunar landing. An overview of the 8-day voyage of Apollo 10 around the Moon. (U-S-A)

_____MODEL SPACECRAFT CONSTRUCTION. UNITS FOR SECONDARY SCHOOL INDUSTRIAL ARTS. #NAS 1.2:SP 1/16. Supt. of Documents, 184 p., illus., 1966 Rev. Paperback, $1. A guide to building 12 model spacecraft, together with brief descriptions of the functions and missions of each. Models include the Saturn booster rocket, the Orbiting Astronomical Observatory, Mariner, Gemini, Apollo, the Lunar Module of Apollo, and others. Prepared at the California State College, Long Beach, from plans supplied by NASA to a committee of industrial arts specialists. (A)

_____NASA ASTRONAUTS. #NAS 1.19:34/3. Supt. of Documents, 40 p., illus., 1968. 35 cents. An illustrated booklet providing background information about the astronauts, together with photographs, biographies and an explanation of training procedures. (P-I-U-S)

_____NASA EDUCATIONAL PUBLICATIONS. U. S. National Aeronautics and Space Administration. A booklet listing educational materials published by the National Aeronautics and Space Administration for teachers, students and the public. Lists booklets and fact sheets on NASA programs and projects, also curriculum resource aids for teachers, and includes instructions for ordering materials. The booklet is free. (P-I-U-S-A)

_____NASA FACTS ORGANIZATION SERIES. U. S. National Aeronautics and Space Administration. Fact sheets describing the functions and organization of the NASA Centers. One copy free. (S-A)

- #0-2 NASA Ames Research Center
- #0-4 NASA Flight Research Center
- #0-5 NASA Goddard Space Flight Center
- #0-6 NASA John F. Kennedy Space Center
- #0-7 NASA Langley Research Center
- #0-8 NASA Lewis Research Center
- #0-9 NASA Manned Spacecraft Center
- #0-10 NASA George C. Marshall Space Flight Center
- #0-11 NASA Wallops Station

_____NASA FILM LIST. U. S. National Aeronautics and Space Administration. A booklet listing selected free-loan general interest films describing NASA research and development programs in space and aeronautics, and documenting the results of this research. A separate list of NASA technical films is also available. Lists are free. (I-U-S-A)

_____NASA SPACECRAFT #NAS 1.19:54. Supt. of Documents, 26 p., illus., 1969. 50 cents. A booklet describing the present family of NASA

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spacecraft. All types are discussed—some small, some large; some spin-oriented, some accurately attitude-controlled; some manned, some automated; some in low orbits, some in trajectories to the Moon and the planets; some free in space until they expire, others commanded to return to Earth or land on the Moon. (S-A)

_____NASA: TWENTIETH CENTURY EXPLORER. U. S. National Aeronautics and Space Administration. An illustrated booklet describing career opportunities in aerospace technology announced by the Boards of U. S. Civil Service Examiners for the National Aeronautics and Space Administration. Describes the work of NASA and its facilities. Also discusses educational and training requirements, salary schedules, and instructions for applying for positions. Free. (S-A)

_____ORBITING GEOPHYSICAL OBSERVATORY. NASA FACTS #NAS 1.20:2/13. Supt. of Documents, 8 p., illus., 1965. 15 cents. Describes the first of a series of large satellites designed to broaden knowledge about Earth and space, and how the Sun affects both. (U-S-A)

_____ORBITING SOLAR OBSERVATORY. NASA FACTS #NAS 1.20:3/7. Supt. of Documents, 8 p., illus., 1966. 10 cents. Describes the mission of the OSO—obtaining understanding of the Sun. (U-S-A)

_____ORBITS AND REVOLUTIONS. NASA FACTS, Science Series. #NAS 1.20:S-7. Supt. of Documents, 4 p., illus., 1968. 10 cents. A description of the physical and mathematical principles that govern the movement of one body about another in the environment of space. (S)

_____PAVEMENT GROOVING AND TRACTION STUDIES. #N69-20451. Clearing House, 1969. $3. Papers presented by representatives of government and civil organizations at a conference held in November 1968, concerning research on the landing and braking of aircraft on wet runways. Runway grooving research conducted by NASA is featured. Semi-technical. (A)

_____PEGASUS. NASA FACTS #NAS 1.20:2/15. Supt. of Documents, 8 p., illus., 1965. 10 cents. Supt. of Documents. Summary of the goals and a description of the satellite sent aloft to collect data on meteoroids and their impact on the spacecraft. (U-S-A)

_____PICTURE SET 1. "Apollo—In the Beginning." #NAS 1.23/2: Set 1. Supt. of Documents. A set of seven 11" x 14" pictures, in color, covering various scenes of the Apollo missions. $1.25 per set. (P-I-U-S-A)

_____PICTURE SET 2. "Men of Apollo." #NAS 1.23/2: Set 2. Supt. of Documents. A set of five 11" x 14" pictures, in color, of the crews of Apollo 7, 8, 9, 10 and 11. $1 per set. (P-I-U-S-A)

_____PICTURE SET 3. "Eyewitness to Space." #NAS 1.23/2: Set 3. Supt. of Documents. A set of twelve 16" x 20" color prints of reproductions of paintings of space subjects as interpreted by well-known American artists. $2.75 per set. (P-I-U-S-A)

_____PICTURE SET 4. "First Manned Lunar Landing." #NAS 1.23/2: Set 4. Supt. of Documents. A set of twelve 11" x 14" full-color lithographs of the landing on the Moon. $1.75 per set. (P-I-U-S-A)

_____PICTURE SET 5. "Man on the Moon." #NAS 1.23/2: Set 5. A 16" x 20" full-color lithograph showing man on the Moon for the first time. $1. (P-I-U-S-A)

_____PIONEER SPACECRAFT, THE. #NAS 1.20:4/3. Supt. of Documents, 8 p., illus., 1967. 10 cents. A booklet describing the Pioneer space probes which investigated and monitored interplanetary phenomena at widely separated points in space. (S-A)

_____THE PLANETARIUM. #NAS 1.19:42. Supt. of Documents, 60 p. A report by the University of Bridgeport on projects for elementary school classes in the Bridgeport Planetarium. 40 cents. (A)

_____PROGRESS OF NASA RESEARCH RELATING TO NOISE ALLEVIATION OF LARGE SUBSONIC JET AIRCRAFT. SP-183. Clearing House, 682 p., illus., 1968. $3. A collection of technical papers presented at a conference held in October 1968. While most of the material is technical, summary and conclusion sections are readily understandable to the general reader. Topics discussed were treating engine surfaces and parts acoustically, reducing the sources of engine noise, setting up flying maneuvers for noise abatement, and how aircraft noise affects people. (A)

_____PROJECT RELAY. NASA FACTS #NAS 1.20:G-12-62. Supt. of Documents, 8 p., illus., 1963. 15 cents. A description of an early (1962) communications satellite that preceded the development of sophisticated multi-channel telephone and television satellite systems. (S-A)

_____PUTTING SATELLITES TO WORK. #NAS 1.19:53. Supt. of Documents, 26 p., illus., 1969. 50 cents. A booklet describing communications, navigation, geodetic and meteorological space

systems that are in operation today. Also covers the applications satellites of future programs, including surveying the Earth's resources from space. (S-A)

_____A REPORT FROM MARINER IV. NASA FACTS #NAS 1.20:33. Supt. of Documents, 8 p., illus., 1966. 10 cents. Final report on the results of the Mariner fly-by of the planet Mars. (U-S-A)

_____REPORT FROM MARS. #NAS 1.19:39. Supt. of Documents, 46 p., illus., 1966. 50 cents. A booklet summarizing the successful Mariner IV mission to the planet Mars. (U-S-A)

_____SATURN V. NASA FACTS #NAS 1.20: 4/5. Supt. of Documents, wall sheet, illus., 1967. 25 cents. A full color display sheet of Saturn V, America's largest rocket vehicle, which launches the Apollo spacecraft. (P-I-U-S-A)

_____SEMIANNUAL REPORTS TO CONGRESS. Supt. of Documents. A series of reports covering NASA activities and events for the six-month period as indicated. (A)

16th Semiannual Report. #NAS 1.1:966-2 (July-Dec. 1966) $1.50

17th Semiannual Report. #NAS 1.1:967 (Jan.-June 1967) $1.50

18th Semiannual Report. #NAS 1.1:967-2 (July-Dec. 1967) $1.50

19th Semiannual Report. #NAS 1.1:968 (Jan-June 1968) $1.25

_____SEVEN STEPS TO A CAREER IN SPACE SCIENCE AND TECHNOLOGY. #NAS 1.19:33. Supt. of Documents, 62 p., 1966. 45 cents. A booklet for high school students presenting an overview of career choices in space science, engineering, and technology. Includes ideas and suggestions to follow up in exploring these career opportunities. (S)

_____SHAPES OF TOMORROW, THE. #NAS 1.2:Sh 2. Supt. of Documents, 204 p., illus., 1967. $1.50. A supplement in space-oriented geometry for secondary levels. Prepared by NASA in cooperation with the U. S. Office of Education. (A)

_____SIGNIFICANT ACHIEVEMENTS IN IONOSPHERES AND RADIO PHYSICS, 1958-64. #NAS 1.21:95. Supt. of Documents, 60 p., illus., 1966. Paperback, 45 cents. A summary of newly discovered phenomena and a discussion of new space techniques for studying the ionospheres. Semi-technical. (A)

_____SIGNIFICANT ACHIEVEMENTS IN PARTICLES AND FIELDS, 1958-64. #NAS 1.21:97. Supt. of Documents, 94 p., illus., 1966. Paperback, 50 cents. Knowledge in the field of geophysics resulting from NASA space research. Discusses the solar wind and its effects on the Earth, radiation belts, the Earth's magnetic field, cosmic rays and neutrons. Semi-technical. (A)

_____SIGNIFICANT ACHIEVEMENTS IN PLANETARY ATMOSPHERES, 1958-64. #NAS 1.21:98. Supt. of Documents, 1966. A book giving highlights and results of space research related to the atmospheres of the Earth, Mars, Venus, Jupiter, and meteoroids. Semi-technical. 45 cents. (A)

_____SIGNIFICANT ACHIEVEMENTS IN PLANETOLOGY, 1958-64. #NAS 1.21:99. Supt. of Documents, 71 p., 1966. Discusses observations made from spacecraft and also Earth-bound observation resulting in new information about the geology, geography, mineralogy, petrography, seismology, and vulcanology of the planets and their satellites, comets, and asteroids. Semi-technical. 45 cents. (A)

_____SIGNIFICANT ACHIEVEMENTS IN SATELLITE METEOROLOGY, 1958-64. #NAS 1.21:96. Supt. of Documents, 141 p., illus., 1966. Paperback, 60 cents. Summary is useful to the nonspecialist. Semi-technical. (A)

_____SIGNIFICANT ACHIEVEMENTS IN SOLAR PHYSICS, 1958-64. #NAS 1.21:100. Supt. of Documents, 95 p., illus., 1966. Paperback, 50 cents. Discusses the frontiers of solar research, instrumentation, mapping the Sun's ultraviolet and soft x-ray spectra, solar hard x-ray emission, corona, satellite monitoring of solar radiation, and the future of solar physics research. Semi-technical. (A)

_____SIGNIFICANT ACHIEVEMENTS IN SPACE APPLICATIONS. #NAS 1.21:156. Supt. of Documents, 91 p., illus., 1968. Paperback, 50 cents. A report on the progress made in deriving social and economic benefits from satellites. (S-A)

_____SIGNIFICANT ACHIEVEMENTS IN SPACE ASTRONOMY, 1958-64. #NAS 1.21:91. Supt. of Documents, 73 p., 1966. Discusses discoveries stemming from NASA space programs using new tools and techniques in x-ray and gamma ray astronomy, ultraviolet and infrared astronomy, and low frequency radio astronomy, resulting in more accurate knowledge of the universe. Semi-technical. 45 cents. (A)

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_____SIGNIFICANT ACHIEVEMENTS IN SPACE BIOSCIENCE, 1958-64. #NAS 1.21:92. Supt. of Documents, 128 p., 1966. A semi-technical book whose concluding chapter on significance will be useful to the general reader. 55 cents. (A)

_____SIGNIFICANT ACHIEVEMENTS IN SPACE COMMUNICATIONS AND NAVIGATION, 1958-64. #NAS 1.21:93. Supt. of Documents, 68 p., illus., 1966. Paperback, 45 cents. Information about passive and active communications satellites, and outlook for future use. Semi-technical. (A)

_____SIGNIFICANT ACHIEVEMENTS IN SPACE SCIENCE. #NAS 1.21:167. Supt. of Documents, 419 p., illus., 1967. Paperback, $2.50. A summary of numerous important developments in the space-related sciences occurring as a result of the national space program. Semi-technical. (S-A)

_____SIMULATORS. NASA FACTS #NAS 1.20: 4/8. Supt. of Documents, 8 p., illus., 1967. 10 cents. A description of devices used by NASA to determine how proposed airplanes, spacecraft, launch vehicles, and their components will function on missions; or apparatus designed to perfect pilot and astronaut training and mission planning; while remaining within the precise control of ground-based laboratories. (U-S-A)

_____SOLAR CELLS. NASA FACTS #NAS 1.20:S-6. Supt. of Documents, 4 p., illus., 1968. 5 cents. An explanation of the primary source of electrical power for the majority of NASA's unmanned space missions. (S)

_____SPACE APPLICATIONS SUMMER STUDY. 1967 Interim Report, Volume 1. #NAS 1.2:Sp 1/15/V.1. Supt. of Documents, 65 p., 1968. Paperback, 45 cents. A NASA publication giving summaries, recommendations and conclusions of panel reports made by scientists on those aspects of space technology that are likely to produce practical benefits to world economies, and contribute to the well-being of large groups of people. Benefits appear to be large—larger than the cost of achieving them. Meteorology, hydrology, oceanography, forestry, agriculture, geology, geodesy-cartography, communications and navigation were considered. (S-A)

_____SPACE LAUNCH VEHICLES. NASA FACTS #NAS 1.20:NF-8. Supt. of Documents, 8 p., illus., 1967. 10 cents. Facts and figures on rocket vehicles used to launch NASA spacecraft. (U-S-A)

_____SPACECRAFT TRACKING. #NAS 1.19: 55. Supt. of Documents, 18 p., illus., 1969. 40 cents. A booklet describing how spacecraft are precisely located in space. (S-A)

_____SPACECRAFT TRACKING AND COMMUNICATION. #NAS 1.20:S-2. Supt. of Documents, 4 p., illus., 1967. 5 cents. A simplified description of the electronics bridge between Earth-based controls and mission-performing manned and unmanned spacecraft. (U-S)

_____SPACE JOBS. #NAS 1.19:31. Supt. of Documents, 11 p., illus., 1966. 15 cents. An illustrated 16-page booklet written especially for pupils in kindergarten through the third grade. (P)

_____SPACE NAVIGATION. NASA FACTS #NAS 1.20:NF-37. Supt. of Documents, 8 p., illus., 1968. 10 cents. Describes the techniques which will be used for long trips in space, based upon techniques in use for the navigation of ships and airplanes, and now adapted to the special needs of space flight. (U-S-A)

_____SPACE PHYSICS AND ASTRONOMY. #NAS 1.19:51. Supt. of Documents, 22 p., illus., 1969. 45 cents. A booklet listing progress made in the study of cosmic rays, energetic particles, magnetic field measurements, ionospheres, radio physics, planetary atmospheres, solar physics, astronomy, cometary physics and interplanetary dust. (S-A)

_____SPACE RESOURCES FOR TEACHERS: BIOLOGY. #NAS 1.19:50. Supt. of Documents, 236 p., illus., 1969. $2.75. An educational tool to update the biology teacher and to relate classroom instruction to fast growing developments in the life sciences coming out of the space program. Selected ideas, topics and illustrations to enrich instruction. Prepared for NASA by the staff of the Lawrence Hall of Science, University of California, Berkeley. (A)

_____SPACE RESOURCES FOR TEACHERS: SPACE SCIENCE. #NAS 1.19:64. Supt. of Documents, 144 p., illus., 1969. $2. A curriculum resource publication with units in space science to supplement standard science and mathematics courses. It cuts across the barriers that separate the disciplines included in the modern organization of science, and demonstrates that all disciplines illuminate a number of inter-related central problems. (A)

_____SPACE RESOURCES FOR THE HIGH SCHOOL: INDUSTRIAL ARTS RESOURCE UNITS.

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#NAS 1.19:44. Supt. of Documents, 178 p., illus., 1968. $2.25. Suggestions for relating space concepts to instruction in secondary school industrial arts. Prepared by industrial arts teachers under the direction of the Western Michigan University Industrial Arts Department. (A)

_____SPACE: THE NEW FRONTIER. #NAS 1.19:6/3. Supt. of Documents, 96 p., illus., 1967. 75 cents. An introduction to space exploration and the programs of NASA. (U-S-A)

_____A SURVEY OF SPACE APPLICATIONS. #NAS 1.21:142. Supt. of Documents, 135 p., 1967. 70 cents. Real and feasible uses of space technology in communications, surveying the Earth's resources, geodesy, meteorology, and navigation are discussed. (S-A)

_____SURVEYOR. NASA FACTS #NAS 1.20: 4/6. Supt. of Documents, 12 p., illus., 1967. 15 cents. Discusses the Surveyor spacecraft that made soft landings on the Moon and transmitted photographs and data back to Earth. (I-U-S-A)

_____TELEMETRY. NASA FACTS #NAS 1.20: S-3. Supt. of Documents, 4 p., illus., 1967. 5 cents. A simple presentation of the process of measuring at one point and transmitting the recorded data to a distant point for evaluation and use. Relates the process to use in the space program. (U-S)

_____THIS IS NASA. #NAS 1.19:22. Supt. of Documents, 22 p., illus., rev. 1969. 45 cents. A booklet providing a brief resume of NASA's past, present and future programs. (S-A)

_____U. S. LAUNCH VEHICLES FOR PEACEFUL EXPLORATION OF SPACE. NASA FACTS #NAS 1.20:2/5/supp./rev. Supt. of Documents, wall sheet, illus., rev. 1969. 25 cents. Describes the rocket engines, and gives scale drawings and statistics for the principal NASA launch vehicles. (P-I-U-S-A)

_____VENTURE INTO SPACE: Early Years of Goddard Space Flight Center. #NAS 1.21:4301. Supt. of Documents, 354 p., illus., 1968. Paperback, $2.50. Describes the origins and traditions of the Goddard Space Flight Center, as well as the projects and activities contributing to the U. S. space program through 1963. (S-A)

_____WEIGHTLESSNESS. NASA FACTS Science Series #NAS 1.20:S-5. Supt. of Documents, 4 p., illus., 1967. 5 cents. The term "weightlessness" is explained by everyday experience and simple experiments in this description of a complex phenomenon. (U-S)

_____WHAT'S UP THERE, A Source Book in Space Oriented Mathematics for Grades 5-8. Student edition. #NAS 1.2:W 55/student. Supt. of Documents, 144 p., illus., $1. (I-U) Teachers' edition. #NAS 1.2:W 55/teacher. Supt. of Documents, 144 p., illus., $1. (A)

U.S. National Council on Marine Resources and Engineering Development. UNITED STATES ACTIVITIES IN SPACECRAFT OCEANOGRAPHY. Supt. of Documents. #P E 12.2:Sp 1. 44 p., illus., 1967. Paperback, 65 cents. An introduction to current U.S. research in the use of spacecraft for study of the oceans. Presents examples of opportunities for a broad extension of ocean observation techniques. (S-A)

U.S. Senate. Committee on Foreign Relations. TREATY ON OUTER SPACE. Hearings before the Committee on Foreign Relations, U.S. Senate, 90th Congress, 1st Session. March 7, 13, and April 12, 1967. U.S. Senate. Committee on Foreign Relations. Free. Features testimony of the then Secretary of State Dean Rusk and United Nations Ambassador Arthur J. Goldberg in behalf of the Treaty. Questions and answers raised during the hearing are reproduced, plus the text of the "Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other celestial bodies." (U-S)

University of Denver. EFFECTS OF A NATIONAL SPACE PROGRAM ON UNIVERSITIES. University of Denver, 233 p., illus., 1968. Available from the Denver Research Institute. Free. A critical examination of the relationship between NASA and the universities, and the problems resulting from this relationship. Proceedings of the University of Denver Coloquium held April 1968. (A)

Useller, James W. CLEAN ROOM TECHNOLOGY. #NASA-SP-5074. Clearing House, 69 p., 1969. 35 cents. A "how to" book providing a series of lectures for people who operate a clean room. The lectures were given at the NASA Lewis Research Center, and present a set of standards for industrial and scientific use. (S-A)

Valens, E. G. CYBERNAUT, A Space Poem. Viking, 46 p., 1968. $3.50. Louis Untermeyer appraises this poem as having the "force and feeling of outer space." (U-S)

_____THE ATTRACTIVE UNIVERSE: Gravity and the Shape of Space. World, 187 p., illus.,

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1969. $5.95. An explanation of the force of gravity and its application to space travel. Includes many helpful diagrams and analogies. (S-A)

Vermillion, Charles A. WEATHER SATELLITE PICTURE RECEIVING STATIONS. Inexpensive Construction of Automatic Picture Transmission Ground Equipment. #NASA-SP-5080. Clearing House, 83 p., plus Appendix, 1969. $3. Advice and directions about building a weather satellite picture receiving station using inexpensive materials. (S-A)

Vlasic, Ivan A., editor. EXPLORATION IN AEROSPACE LAW. Selected essays by John Cobb Cooper, 1946-1966. McGill University Press, 480 p., 1968. $11.50. A collection of writings of an outstanding authority on legal problems of aeronautics and astronautics. Includes discussions of United Nations relationship to international space law. (A)

Webb, James E. SPACE AGE MANAGEMENT. McGraw-Hill, 173 p., 1969. $6.95. A former NASA Administrator gives his views on the management problems of a diverse, large-scale technical organization working within the framework of the federal government and the "democratic process." (A)

Webster Division, McGraw-Hill Book Company. ARIZONA CRATER: THE CASE FOR IMPACT. Webster Division-McGraw-Hill Book Company. An 11-page illustrated booklet reproducing a scientific paper published by D. M. Barringer in 1905 in support of his theory as to the origin of the Arizona Crater. A booklet in the "Time, Space and Matter Science Reading Series." 52 cents. (S)

_____THE LUNAR FIRST. Webster Division-McGraw-Hill Book Company. An illustrated 16-page booklet reproducing a translation of Galileo's "The Starry Messenger" or his first observations of the Moon made upon completion of his first telescope. A booklet in the "Time, Space and Matter Science Reading Series." 52 cents. (S)

_____THE MOON'S FACE. Webster Division-McGraw-Hill Book Company. A 16-page illustrated booklet providing an adaptation of a paper by G. K. Gilbert in which he defends his theory about the volcanic origin of the Moon's craters. The paper was first presented in 1892. A booklet in the "Time, Space and Matter Science Reading Series." 52 cents. (S)

_____THE MOTIONS OF EARTH ABOUT A FIXED SUN. Webster Division-McGraw-Hill Book Company. A 13-page illustrated booklet providing a translation of Copernicus' "Concerning the Revolutions of the Heavenly Spheres." A booklet in the "Time, Space and Matter Science Reading Series." 52 cents. (S)

Whipple, Fred L. EARTH, MOON, AND PLANETS. Harvard University Press, 297 p., illus., rev. 1968. $7.25. Information about the Earth, Moon, and planets reflecting the considerable increase in knowledge about these bodies gathered from spacecraft over the past four or five years. (A)

Whirlpool Corporation. FOOD MANAGEMENT IN SPACE. Whirlpool Corporation. An illustrated folder outlining the problems of eating aboard a spacecraft and how these problems are being solved. Free. (P-I-U-S)

Widger, William K., Jr. METEOROLOGICAL SATELLITES. Holt, 272 p., illus., 1966. Paperback, $1.96. The applications of spacecraft to meteorological observations and weather forecasting, and the development and operation of the TIROS and Nimbus weather satellites and the more sophisticated meteorological satellites of the future are discussed. (S)

Wilfred, John N. WE REACH THE MOON. Bantam, 320 p., illus., 1969. Paperback, $1.25. Coverage of the Apollo 11 flight to the Moon, including extensive background information gathered from articles in the *New York Times* and concluding with a report of the flight as written by the Times' space exploration reporter. (U-S-A)

Wright, Hamilton, Helen Wright and Samuel Rapport, editors. TO THE MOON: A Distillation of Great Writings from Ancient Legend to Space Exploration. Meredith, 300 p., 1968. $6.95. An anthology on the Moon, including legends, poetry, folklore, observations, and exploration. (A)

Wyler, Rose and Gerald Ames. EXPLORING OTHER WORLDS. Golden, 80 p., illus., 1968. Paperback, 75 cents. Excerpted material from *The New Golden Book of Astronomy.* (P-I)

Yale Reports. NO WAR IN SPACE: THE MOON TREATY AND AFTER. #439. Yale Reports. May 1967. A 9-page leaflet reproducing a script of a radio program involving the chairman of the United Nations Outer Space Committee and a prominent scientist, lawyer, and engineer. Free. (S-A)

Young, Richard S. EXTRATERRESTRIAL BIOLOGY. Holt, 121 p., illus., 1966. Paperback, $1.96. A discussion of the possibilities of life on other planets

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with respect to ancient and recent theories of the origin of life. Describes experimental investigations carried on in laboratories and in space. (S)

_____LIFE BEYOND EARTH. Silver Burdett, 64 p., illus., 1969. Paperback, $1.35. Considers life on other planets and how scientists search for evidences of extraterrestrial life. A book in the "21st Century Monografics" series. (I-U-S)

Zaffo, George. THE GIANT BOOK OF THINGS IN SPACE. Doubleday, 160 p., illus., 1969. $4.95. An illustrated account of the many facets of space travel written for young children. A minimum of text accompanies the drawings. (P)

Zarem, Lewis. CAREERS AND OPPORTUNITIES IN ASTRONAUTICS. Dutton, 290 p., illus., rev. 1969. $6.95. A comprehensive guide to careers in all branches of the science and technology of space flight. Covers opportunities in both government and industry. Discusses nature of work, preparation required, and rewards. Also discusses the nation's space program in general. (S-A)

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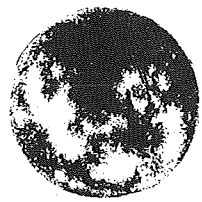
reference materials



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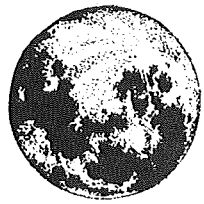

Atlases

Alter, Dinsmore, editor. LUNAR ATLAS. Dover, 343 p., illus., 1968. Paperback, $5. A first reprinting of an original limited edition prepared by the Space Sciences Laboratory, Space Division, North American Aviation, Inc. (now North American Rockwell). Includes 219 of the finest telescopic photos of the Moon made by the Mt. Wilson, Palomar, Lick, Yerkes, and McDonald observatories, as well as at observatories in the Soviet Union and in France. A descriptive text accompanies each plate. (S-A)

_____PICTORIAL GUIDE TO THE MOON. Crowell, 199 p., illus., rev. 1967. $8.95. A detailed guide to lunar geography illustrated with many photographs from Ranger, Orbiter and Surveyor spacecraft. A unique system of coordinates helps locate specific features mentioned in the text. A glossary is included. (S-A)

American Map Company. SPACE ATLAS. #1447. American Map Company. 50 p., illus., undated. The text, by the U.S. Naval Institute, gives information on the universe, the solar system, Moon, the Earth in space, and calendar and time factors. Also includes a small map of the Moon. $1.25. Minimum order $5, unless order is prepaid, including postage. (S-A)

Bibliographies

Adler Planetarium Staff. BIBLIOGRAPHY FOR ASTRONOMY AND ASTROPHYSICS. #2. Adler Planetarium, 12 p., undated. Single copy free to teachers and librarians. A compilation of books, textbooks, atlases, annuals, and periodicals to serve as a guide in setting up a library for introductory courses on the secondary school and college levels. (A)

Fry, Bernard M. and Foster E. Mohrhardt. SPACE SCIENCE AND TECHNOLOGY. Volume 1 of *Guides to Information Sources in Science and Technology.* Wiley, 579 p., 1963. $9.50. An annotated bibliography with both subject and authors' indexes. Lists books, reports, papers, conference proceedings, reprints, journals, etc., some of which are of a non-technical nature. Subjects covered include satellites, environmental and medical factors, Soviet astronautics, space law, space flight, propulsion and propellants, and the U.S. space program. (A)

Koenig, Martha J. THE IMPACT OF THE SPACE AGE ON EDUCATION IN THE UNITED STATES, 1957-1969. U.S. Senate Committee on Aeronautical and Space Sciences, 21 p., 1969. Free. An annotated compilation of government and United Nations documents, books, reports, pamphlets, papers, periodicals, and space curriculum guides that reveal the impacts of space exploration on the educational aspects of American life. Limited supply. (A)

Marshall, Jane N., editor. AVIATION EDUCATION BIBLIOGRAPHY. National Aerospace Education Council, 5th edition, 66 p., 1967. Paperback, 50 cents. An annotated, graded list of selected aviation books, references, periodicals, free and inexpensive teaching aids, films, and filmstrips on such subjects as aviation history, biography, types of aircraft, aviation weather, air transportation, learning to fly, military aviation, and the theory of flight. Books include those published in the period 1964 through spring 1967. Books and materials concern all reading levels—primary through adult. (A)

McGraw-Hill. McGRAW-HILL BASIC BIBLIOGRAPHY OF SCIENCE AND TECHNOLOGY. McGraw-Hill, 738 p., 1966. $19.50. More than 8,000 listings of books in all scientific and technological fields, including astronautics and space technology. Each entry gives title, author, publisher, publication date, a concise description of the book and its user level. Includes textbooks, handbooks, manuals, technical titles, as well as more general publications. Includes a topical index. (S-A)

Ordway, Frederick I. III, editor. ANNOTATED BIBLIOGRAPHY OF SPACE SCIENCE AND TECHNOLOGY. Arfor, 77 p., rev. 1962. Paperback, $2.95. A list of the literature of space science and technology, 1931 through 1961, arranged by year. Includes more than 450 titles, a third of them in the Astronomical Supplement. (S-A)

Smithsonian Astrophysical Observatory. RECOMMENDED BOOKS ON SPACE SCIENCE AND ASTRONOMY. Smithsonian Astrophysical Observa-

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tory. A 10-page listing of books on space flight and astronomy subjects selected by the Observatory staff for all reading levels through high school. The entries are graded but are without annotations. Free. (P-I-U-S)

United Nations. INTERNATIONAL DIRECTORY OF FACILITIES FOR EDUCATION AND TRAINING IN BASIC SUBJECTS RELATED TO THE PEACEFUL USES OF OUTER SPACE. United Nations, 102 p., 1968. Paperback, $2. A list of organizations, schools, learned societies, foundations, trusts, research establishments and other facilities carrying on work related to the peaceful uses of space. Agencies are listed by country of origin or, if international, under "International Facilities." (S-A)

U.S. Government Printing Office, Superintendent of Documents. SPACE: Missiles, The Moon, NASA and Satellites. Price List 79A. Supt. of Documents. Price list of space publications available from the Superintendent of Documents, U.S. Government Printing Office. List covers publications on missiles, the Moon, NASA projects, satellites, space education, space exploration, and research and technology of interest to the general reader. Free. (U-S-A)

U.S. National Aeronautics and Space Administration. Supt. of Documents. Selected annotated lists of books on space flight, space exploration, and aeronautical research subjects under study by NASA. Also includes sources of related teaching materials:

AERONAUTICS AND SPACE BIBLIOGRAPHY FOR ELEMENTARY GRADES. 1961. Listings cover books published from January 1958 through June 1961. *Out of print.* (A)

AERONAUTICS AND SPACE BIBLIOGRAPHY FOR ELEMENTARY GRADES. 2nd edition, 1963. Listings cover books published from January 1960 through March 1963. *Out of print.* (A)

AERONAUTICS AND SPACE BIBLIOGRAPHY FOR SECONDARY GRADES. 1961. Listings cover books published from January 1958 through June 1961. *Out of print.* (A)

AERONAUTICS AND SPACE BIBLIOGRAPHY FOR SECONDARY GRADES. 2nd edition, 1963. Listings cover books published from January 1960 through March 1963. *Out of print.* (A)

AERONAUTICS AND SPACE BIBLIOGRAPHY. A Bibliography of Adult Aerospace Books and Materials. 1961. Listings include books published from January 1958 through June 1961. *Out of print.* (A)

AERONAUTICS AND SPACE BIBLIOGRAPHY: Adult Aerospace Books and Materials. 2nd edition, 1963. Listings cover books published from January 1960 through March 1963. *Out of print.* (A)

AEROSPACE BIBLIOGRAPHY. 3rd edition, 1966. #NAS 1.19:35. Listings, mostly nontechnical, cover books published from January 1963 through summer 1965, including under one cover for the first time books for the general reader, primary through adult levels. 50 cents. (A)

AEROSPACE BIBLIOGRAPHY. 4th edition, 1968. #NAS 1.19:48. Listings, mostly nontechnical, cover books published from January 1965 through summer 1967. Reading levels from primary grades to adult and college. 40 cents. (A)

_____AEROSPACE MEDICINE AND BIOLOGY: A CONTINUING BIBLIOGRAPHY. Clearing House. Published at intervals throughout the year. A bibliography of world literature on aviation and space medicine subjects: space biology, ecology, psychology, sensory mechanisms, physiology, psychiatry, stress physiology, toxicity, accidents, safety, etc. Includes author, source and subject indexes. Note: Volumes I and II—*Aviation Medicine: An Annotated Bibliography,* and Volumes III-XI—*Aerospace Medicine and Biology: An Annotated Bibliography*—covering literature for the years 1952-63 are also available from Clearing House at various prices. *Aerospace Medicine and Biology: A Continuing Bibliography* picks up with 1964 literature and continues to the present. Write to Clearing House for further information as to catalog numbers, dates, and prices. (A)

_____EXTRATERRESTRIAL LIFE: A Bibliography. Supt. of Documents:

Part 1, Report Literature. 1952-64. #NAS 1.21: 7015. 76 p., 1965. 45 cents. Annotated selected references to domestic and foreign reports prepared during the period 1952 through July 1964 and stored in the NASA information system. (A)

Part 2, Published Literature. 1900-64. #NAS 1.21: 7015/pt. 2. 335 p., 1965. $2. Annotated published literature, 1900-1964, listing journal articles and books on such subjects as the origin of life on earth, the suitability of environment of other planets for the development of life, the possibility of intelligent life, and the chemical basis of life. A limited selection of 1965 sources is also included. (A)

Order items directly from sources as indicated. Addresses of sources may be located on pages 94 to 101.

Chronologies

Emme, Eugene M., compiler. AERONAUTICS AND ASTRONAUTICS. An American Chronology of Science and Technology in the Exploration of Space. 1915-60. Supt. of Documents, 240 p., 1961. *Out of print.* A chronological list of achievements in scientific research and engineering development which lie behind the major milestones in man's conquest of the air and space. Appendices include a log of Earth satellites and space probes through 1960, and major astronautics awards and honors over the years. (S-A)

_____AERONAUTICAL AND ASTRONAUTICAL EVENTS OF 1961. Committee on Science and Astronautics, U.S. House of Representatives, 113 p., 1962. *Out of print.* A sequel to Eugene Emme's chronological list of aerospace achievements from 1915 through 1960—*Aeronautics and Astronautics 1915-60.* An inventory of decisions, announcements, technical progress and flight achievements in 1961. (S-A)

_____ASTRONAUTICAL AND AERONAUTICAL EVENTS OF 1962. Supt. of Documents, 370 p., 1963. *Out of print.* Report of NASA to the committee on Science and Astronautics, on the activities, problems, and accomplishments of NASA and its academic, industrial, governmental and international partners in the exploration of space during 1962. Also includes a chronology of major NASA launchings from 1958 through 1962. (S-A)

_____ASTRONAUTICS AND AERONAUTICS, CHRONOLOGY ON SCIENCE, TECHNOLOGY, AND POLICY. Supt. of Documents. Chronologies of events and statements compiled from open public sources for the year indicated:

1963. 610 p., #NAS 1.21:4004. $2. (S-A)
1964. 527 p., #NAS 1.21:4005. $1.75. (S-A)
1965. 681 p., #NAS 1.21:4006. $2.25. (S-A)
1966. 479 p., #NAS 1.21:4007. $1.50. (S-A)
1967. 487 p., #NAS 1.21:4008. $2.25. (S-A)
1968. (Ready about December 1969)

Sheldon, Charles S. A CHRONOLOGY OF MISSILE AND ASTRONAUTICAL EVENTS. Supt. of Documents, 189 p., 1961. *Out of print.* A comprehensive list of significant events in missilery and astronautics from 1686, when Sir Isaac Newton described how an Earth satellite is placed into orbit, through February 1961. Includes dates of decisions affecting U.S. space efforts, important launchings, progress reports, predictions for the future, etc. (S-A)

Dictionaries

Caidin, Martin. THE MAN-IN-SPACE DICTIONARY. Dutton, 256 p., illus., 1963. $6.95. Definitions and non-technical explanations of 1900 terms dealing with the science and technology of manned space flight. (S-A)

Gallant, Roy A. THE ABC'S OF ASTRONOMY. Doubleday, 128 p., illus., 1962. $4.50. An illustrated dictionary explaining more than 500 astronomical terms in simple language. Also includes reference maps, a sky map, and instructions for using a telescope effectively. (S-A)

Gentle, Ernest and Charles E. Chapel, editors. AVIATION AND SPACE DICTIONARY. 5th edition. Aero Publishers, 450 p., 1970. $12.50. Comprehensive definitions of more than 10,000 aerospace terms. (U-S-A)

Huffer, Charles M. ASTRONOMY POCKET CRAMMER. Doubleday, 159 p., illus., 1963. *Out of print.* A pocket-size dictionary of astronomy. (S-A)

Marks, Robert W., editor. THE NEW DICTIONARY AND HANDBOOK OF AEROSPACE. Praeger, 531 p., illus., 1969. $10. Available in paperback edition from Bantam, $1.95. A compilation of more than 50,000 definitions of space terms composing a layman's guide to space technology. Includes data on Project Apollo, special features on space navigation, guidance systems, rocket fuels, radar, and power sources, star charts, tables of constellations, planets, and navigational stars, plus details on all major scientific satellites and space probes. (S-A)

McLaughlin, Charles, editor. SPACE AGE DICTIONARY. Van Nostrand, 233 p., illus., rev. 1963. $9.95. Concise, simple, and clear definitions of space age terms relating to rockets, missiles, launch vehicles, satellites, and space flight. (S-A)

Moore, Patrick. AMATEUR ASTRONOMER'S GLOSSARY. Norton, 162 p., illus., 1967. $5.95. Definitions of more than 400 words and phrases in the language of astronomy. (S-A)

Nayler, J. L. DICTIONARY OF AERONAUTICAL ENGINEERING. Littlefield, 318 p., illus., 1967. Paperback, $1.95. An illustrated dictionary compiled by a British engineer who has served on various committees of the British Standards Institution. (A)

_____DICTIONARY OF ASTRONAUTICS. Hart, 316 p., illus., 1964. $9; paperback, $2.65. More

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than 2,000 definitions of space terms, plus chemical and mathematical tables, formulas, and details on space navigation, planetary conditions, orbits, and satellite instrumentation. (S-A)

Newlon, Clarke, compiler. AEROSPACE AGE DICTIONARY. Watts, 282 p., 1965. $5.95. A comprehensive, quick-reference dictionary of aerospace technical terms that the general reader, as well as the specialist, can use. Appendices include brief biographies of persons having major roles in our civilian and military space programs, locations and purposes of NASA centers, military units involved in the space program, conversion factors, and units of measurement. (S-A)

Roes, Nicholas. SPACE FLIGHT DICTIONARY. Follett, 224 p., illus., 1968. $3.95. Explanations of terms related to the vehicles and administration of the American and Soviet space programs, illustrated with line drawings and photographs. (A)

Ruffner, Frederick G., Jr. and Robert C. Thomas, editors. CODE NAMES DICTIONARY. Gale, 555 p., 1963. $15. A glossary of more than 8,500 code names, cover words, and nicknames identifying (without technical information) aviation, military and scientific space activities, systems, equipment, and other terms that have come into use from the year 1910 through Project Apollo. (S-A)

U.S. National Aeronautics and Space Administration. DICTIONARY OF TECHNICAL TERMS FOR AEROSPACE USE. #NAS 1.21:7. Supt. of Documents, 314 p., 1965. $3. Contains more than 6,000 carefully chosen and precisely defined terms. (S-A)

_____SHORT GLOSSARY OF SPACE TERMS. 2nd edition. #NAS 1.21:1/2. Supt. of Documents, 51 p., 1966. 25 cents. Brief definitions of frequently used space terms selected from the *Dictionary of Technical Terms for Aerospace Use.* (U-S-A)

Encyclopedias

Asimov, Isaac, editor. ASIMOV'S BIOGRAPHICAL ENCYCLOPEDIA OF SCIENCE AND TECHNOLOGY. Doubleday, 662 p., illus., 1964. $8.95. Biographies of the world's great scientists and inventors arranged chronologically in order of birth. Covers the entire sweep of history with greatest emphasis on scientists of the 19th and 20th centuries, including the space age. (S-A)

Audel, Theodore. ENCYCLOPEDIA OF SPACE SCIENCE. Theodore Audel and Company, 4 volumes, 1963. Explanations and illustrations of thousands of space science terms involving astronautics, telemetry, electronics, rocketry, spacecraft, space vehicles, and many other space subjects. *Out of print.* (U-S)

Bergaust, Erik, editor. ILLUSTRATED SPACE ENCYCLOPEDIA. Putnam, 188 p., illus., 1965. $3.64. A dictionary/encyclopedia of space terms, including tables and specifications for the various satellites and launch vehicles, a chronology of manned space programs, a condensed log of space projects, a list of space abbreviations, and astronaut biographies and photographs. (U-S)

Cowles Book Company. COWLES ENCYCLOPEDIA OF SCIENCE, INDUSTRY, AND TECHNOLOGY. Cowles, 639 p., illus., rev. 1969. $17.50. A one-volume reference including numerous articles on space flight topics—space biology, astronautics, astronomy, rocket engines and fuels. telemetry, solar cells, etc. (U-S-A)

Galiana, Thomas de, compiler. CONCISE ENCYCLOPEDIA OF ASTRONAUTICS. Follett, 320 p., illus., 1968. $3.95. Paperback, $2.95. Treats all aspects of astronautics from the dreams of Jules Verne to today's preparations for manned lunar flights. Includes brief biographies of the scientists and engineers who have contributed significantly to astronautics, and brief summaries about the men who have pioneered in manned space flight. Specific subjects such as rockets, space installations, space communications, etc., are arranged in alphabetical sequence. (S-A)

Johnson, Raymond J., editor. ABOVE AND BEYOND, the Encyclopedia of Aviation and Space Sciences. Times Mirror School and Library Service. 14 volumes plus Teacher's Guide, illus., 1968. $99. A definitive encyclopedia of aviation and space with 3,500 entries including definitions and cross references, 4,000 illustrations, and index. Written by more than 100 recognized experts in aviation and space flight subjects. (I-U-S)

Lauber, Patricia. THE LOOK-IT-UP-BOOK OF STARS AND PLANETS. Random, 132 p., illus., 1967. $3.95. A children's encyclopedia of information about stars, planets, space, and time, arranged by subject from A to Z. Well illustrated with photos and many colored drawings. (I-U)

McGraw-Hill Book Company. McGRAW-HILL ENCYCLOPEDIA OF SCIENCE AND TECHNOLOGY. McGraw-Hill, 15 volumes, 1966. $295. Includes numerous articles on space science subjects listed alphabetically from apogee to weightlessness. (S-A)

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———————McGRAW-HILL ENCYCLOPEDIA OF SPACE. McGraw-Hill, 830 p., illus., 1968. $27.50. A one-volume encyclopedia featuring rocketry, artificial satellites, space navigation and electronics, man in space, extraterrestrial life, astronomy-astrophysics, the conquest of the Moon, interplanetary and far space exploration, and the present status of astronautics. Also includes historical material and approximately 1,200 photographs, diagrams, and drawings. Gives extensive coverage of space activities of France, Great Britain, Italy, West Germany, Poland, Belgium, Japan, and the Soviet Union. The authorship of individual articles is not disclosed. (S-A)

Muller, Paul, compiler. CONCISE ENCYCLOPEDIA OF ASTRONOMY. Follett, 320 p., 1968. $3.95. Paperback, $2.95. Covers the principal phenomena observable to the naked eye or with simple instruments. Also includes biographies of leading astronomers, optical instruments, the planets, coordinate systems, and astronomical theory. (S-A)

Roes, Nicholas. THE SPACE-FLIGHT ENCYCLOPEDIA. Follett, 320 p., illus., 1968. $3.95. An alphabetically arranged coverage of the U.S. space program from its inception. Also includes detailed entries on rockets, space experiments, and biographies of the scientists and spacemen who have participated in the space program. (U-S-A)

Rudaux, Lucien and F. de Vaucouleurs, editors. LAROUSSE ENCYCLOPEDIA OF ASTRONOMY. Putnam, approx. 400 p., illus., rev. 1962. $17.50. A revised edition of the first encyclopedia devoted entirely to astronomy, with more than 800 illustrations. (S-A)

Spencer-Jones, Harold, and others. THE NEW SPACE ENCYCLOPEDIA. Dutton, 332 p., illus., rev. 1969. $13.95. A completely revised edition which combines details of satellites, missiles, and latest upper atmosphere research with an updated survey of all branches of astronomy. (A)

Weigart, A. and H. Zimmerman. A CONCISE ENCYCLOPEDIA OF ASTRONOMY. American Elsevier, 367 p., illus., 1968. $9. Presents about 1,500 articles on various aspects of astronomy, including celestial mechanics, radio astronomy, and astronomical instruments, plus artificial satellites and space travel. (S-A)

Miscellaneous Special References

Baker, Norman, editor. SOVIET SPACE LOG 1957-1969. Space Publications, approx. 60 p., illus., rev. 1969. Paperback, $3.50. A concise report on every Soviet space flight mission from the launch of SPUTNIK 1 on October 4, 1957 through 1968. Data include information on orbits, launch sites, launch vehicles, orbital life, number of objects involved, and an analysis of the missions' objectives. Compiled in chronological order and also by mission category. (U-S-A)

———————WHO'S WHO IN SPACE. 1968-69. 2nd edition. Space Publications, approx. 500 p., 1969. $30. A biographical listing of the world's leaders in space activities. Included are leaders in government, industry and academia; Russian cosmonauts and U.S. astronauts; space societies, organizations, and awards. (S-A)

Cortright, Edgar M., compiler and editor. EXPLORING SPACE WITH A CAMERA. #NAS 1.21:168. Supt. of Documents, 214 p., illus., 1968. $4.25. A superb collection of photographs, many in color, selected from thousands of pictures taken of the Earth, the Moon, and space phenomena by cameras in manned and unmanned spacecraft. Each photograph is accompanied by a non-technical explanation. All are organized under three sections: "Above the Atmosphere," "To the Moon and Beyond," and "Man's Ventures Into Space." An Appendix includes photographs of major spacecraft and their specifications. (U-S-A)

Dean, Donald W., editor and publisher. WORLD SPACE DIRECTORY Including Oceanology. Approx. 700 p., published each March and September. Available from Ziff-Davis Aviation Division. $20. Lists officers and addresses of U.S. major and component space/oceanology manufacturers; U.S. government and foreign agencies involved in space/oceanology programs; academic, non-profit research and professional organizations; and colleges and universities offering courses related to space/oceanology research and manufacturing. (S-A)

Engel, Ralph. CATALOG OF AMERICAN SPACE COVERS. International Association of Space Philatelists, 47 p., illus., 1968. Free. A catalog listing major commemorative space covers and their retail prices. Covers are listed in chronological order and are cross-referenced to indicate series name and number. (U-S-A)

Glasstone, Samuel. SOURCEBOOK ON THE SPACE SCIENCES. Van Nostrand, 960 p., illus., 1965. $9.95. Stresses significant advances in existing sciences that can be contributed by space flight. Discusses the impact space exploration has on the growth of knowledge for all scientific and engineering areas. Written in cooperation with the Nationl Aeronautics and Space Administration. Semi-technical. (A)

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Haggerty, James J., editor. 1969 UNITED STATES AIRCRAFT MISSILES AND SPACECRAFT. National Aerospace Education Council, 224 p., illus., 1969. Paperback, $3. A pictorial review of all U.S. aircraft, missiles, and spacecraft currently in production. Includes photographs, brief specifications, performance data and comments; aerospace records and awards, and significant aerospace events in 1968. Some yearbooks dating back to 1957 are also available. Write for list and prices. (U-S-A)

———THE 1969 AEROSPACE YEAR BOOK. Spartan, 669 p., illus., 1969. $12. An official and comprehensive report of aerospace activities in industry and government during 1968. Covers aerospace manufacturing, commercial aviation, government research and development in aerospace areas, and highlights of the 1968 aerospace year. Includes a reference section with descriptions and photographs of more than 700 aircraft, missiles, spacecraft, launch vehicles, engines, sounding rockets and systems in these products. The 1967 and 1968 editions are also available at $11 each. (S-A)

Harmet, A. Richard, editor. SCIENCE YEAR—The World Book Science Annual. Field Enterprises Educational Corporation. Describes and explains the year's important developments in science and technology. Issued annually. Approx. 440 p., illus. $5.95 to *World Book* owners; $6.95 to others. Space science selections in the 1967 edition include articles on the adaptability of man in space, the Sun and its effects on manned space flight, new knowledge from a decade of space exploration, and the impact of weather satellites on long-range world-wide weather forecasts. The 1968 edition includes in-depth articles on remote control techniques for exploring the Moon, and the life history of stars, plus capsule reports on outstanding developments in astronomy and space exploration during the year. The 1969 edition presents a special report on the elaborate facilities for studying samples of lunar materials, and space navigation techniques. (U-S-A)

Interavia. INTERAVIA ABC, WORLD DIRECTORY OF AVIATION AND ASTRONAUTICS. Interavia, approx. 1,400 p., revised each March. $16. Listings in English, French, German, Spanish, and Italian cover all segments of the aviation and astronautics industries of 185 countries, cross-indexed in 86 separate categories. (S-A)

McAllister, Gerald J., editor. AEROSPACE FACTS AND FIGURES. Aero Publishers, 1969 edition, 140 p., illus. Paperback $4. 1968 edition, $4; 1967 edition, $3. A statistical and textual review of the aerospace industry for the year previous to that indicated by the edition date. Covers production, manpower, space programs, research and development, general aviation, air transportation, and military aviation. (S-A)

McGraw-Hill Book Company. McGRAW-HILL MODERN MEN OF SCIENCE. McGraw-Hill:
Volume I—620 p., 1966. $19.50.
Volume II—679 p., 1968. $19.50.
Facts about hundreds of outstanding contemporary scientists throughout the world. In addition to biographical information, each article includes a description of what its subjects accomplished in science, the problems he faced, and how he solved them. Space scientists are included. (S-A)

Moore, Patrick, editor. YEARBOOK OF ASTRONOMY. Norton, issued annually. Star charts, notes on the planets, information on eclipses, and other astronomical events of the year are presented for the amateur astronomer. Also includes a list of astronomical societies and a bibliography. Prices vary according to the year. (S-A)

Moser, Reta C., editor. SPACE-AGE ACRONYMS: Abbreviations and Designations. 2nd edition. Plenum, approx. 600 p., rev. 1969. $17.50. Acronyms of NASA, the U.S. Air Force and Army, and the Federal Aviation Administration, plus abbreviations used for engineering drawings and publications of the aerospace industry. Also includes numerous acronyms of foreign origin. (S-A)

Newlon, Clarke. 1001 ANSWERS TO QUESTIONS ABOUT SPACE. Grosset, 362 p., illus., rev. 1966. Paperback, $2.95. An overview of space exploration and space flight presented in a question and answer form. Considers many topics: telemetry, guidance of spacecraft, propulsion, manned and unmanned space systems, space medicine, space law, extraterrestrial life, and space activities of the future. (U-S-A)

Rand McNally editors. AROUND THE WORLD—A VIEW FROM SPACE. Rand McNally, 128 p., illus., 1968. $4.95. A selection of 96 photographs taken by Gemini astronauts illustrating how the world appears to an astronaut as he orbits the Earth. Each photograph is pin-pointed on a global view of the Earth with a caption describing the area within the photo. Views are arranged to follow an actual flight pattern around the world. (I-U-S-A)

U.S. National Aeronautics and Space Administration. EARTH PHOTOGRAPHS FROM GEMINI III, IV, AND V. #NAS 1.21:129. Supt. of Documents, 266 p., 1967. $7. An atlas containing reproductions of 244 color photographs of the Earth taken by astronauts during the early flights of the Gemini spacecraft. Shows natural features and some man-made features in 50 countries. Clearly visible de-

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tails include shorelines, river courses, valleys, geologic fault zones, glaciers, sand dunes, storm cloud formations, highways, canals, areas of recent rainfall, and smoke from forest fires and industrial plants. (I-U-S-A)

_____EARTH PHOTOGRAPHS FROM GEMINI VI THROUGH XII. Supt. of Documents. #NAS 1.21:171. 327 p., illus., 1968. $8. Spectacular color photographs made of Earth by Gemini astronauts. Many of the pictures have been put to geologic, meteorologic, and oceanographic use. All are of value in agricultural, urban, and other kinds of research. Commentary is included. (I-U-S-A)

_____SPACE SCIENTISTS AND ENGINEERS. Selected Biographical and Bibliographical Listings, 1957-1961. 332 p., 1962. Supt. of Documents. *Out of print.* Brief biographies of approximately 1,000 scientific and engineering personnel making contributions to the advancement of space science and technology, together with listings of their technical papers and published articles. Subject and author indexes are included. (A)

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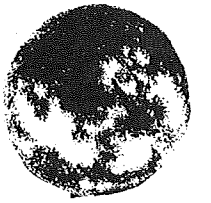

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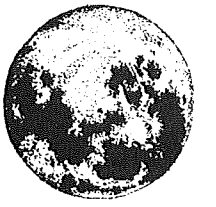

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AEROSPACE BULLETIN. Parks College of Aeronautical Technology. Published quarterly. Free. A 4-page leaflet featuring some aspect of aeronautics or space technology written in non-technical language. (S-A)

AEROSPACE MEDICINE. Aerospace Medical Association. Published monthly. $12 per year. Articles cover such subjects as case reports in clinical aviation and space medicine, medical problems related to flying high performance aircraft and manned spacecraft, psychophysiological problems, the aging pilot, life support systems, weightlessness, civilian and commercial aviation medicine, radiation, and many other medical aspects of flight. Semi-technical. (A)

AMERICAN ROCKETEER. Centuri Engineering Company. Published irregularly. Distributed free to those who request information on model rocketry and/or submit orders for products produced by Centuri Engineering Company. A newsletter to acquaint interested persons with the hobby of model rocketry and with new products and services available. (U-S-A)

ASTRONAUTICS & AERONAUTICS. American Institute of Aeronautics and Astronautics. Published monthly. $12 a year in the U.S.; $14, foreign. Articles on major space missions, spacecraft, launch vehicles, propulsion, problems and possible solutions, and also research and development in aeronautics. While addressed to scientists and engineers of the AIAA, many articles are written in non-technical language. (S-A)

ASTROPHILATELIST, THE. Rocket Research Institute. $2 a year for two or three issues, including an associate membership in the Rocket Research Institute. A newsletter reporting on mail-by-rocket activities. (S-A)

AVIATION WEEK AND SPACE TECHNOLOGY. McGraw-Hill, Inc. Published weekly. $12 a year; single copies, $1. Subsecriptions solicited only from management men, engineers, scientists, pilots, and military officers having a commercial or professional interest in aerospace, including missiles and space technology. Position and company connection must be indicated on subscription orders. Also available to public libraries. Subjects covered: aeronautical engineering, missile engineering, space technology, avionics, air transport, management, finance. (A)

CURRENT SCIENCE. American Education Publications. Published weekly during the school year—30 issues. $1.80 per year; club rates for ten or more subscriptions sent to one address, 90 cents per subscription per year. An 8-page leaflet for junior high school students giving current news about scientific developments. Space flight subjects and space science news are featured regularly. (U-S)

ESSA WORLD. #ESSA/PI 690021. U.S. Department of Commerce, Environmental Science Services Administration. Available from the Supt. of Documents. Published quarterly. $1.25 per year, add 50 cents for foreign mailing; 40 cents for a single copy. Contains articles of general interest on what ESSA is doing in meteorology, oceanography, seismology, and the other geophysical sciences, and in the development of new knowledge, equipment, and techniques. Space activities of ESSA are included. (S-A)

INTERAVIA—Aviation—Astronautics—Electronics. Interavia. Published monthly in separate English, French, German, and Spanish editions with three or four supplements each year. $15 a year; $25, 2 years; $35, 3 years. Reports on all sectors of air transportation, the aerospace industries, and the armed forces throughout the world, as well as on important developments and trends. (A)

JETS JOURNAL. Junior Engineering Technical Society. Published monthly—September through May. $2.50 for nine issues per year for students and schools; $3.50 for others; single issue, $1; film index issue, $2. The official publications of the Junior Engineering Technical Society, dealing with the various engineering fields including aerospace engineering, astronautics, and aeronautics. (S)

MODEL ROCKET NEWS. Estes Industries. Published two to four times per year. A newsletter containing latest developments in model rocketry, safety tips, and technical information. Free to teachers and adults working with youth groups, when requested on official stationery. (U-S-A)

REVIEW OF POPULAR ASTRONOMY. Sky Map Publications. Published six times a year. $4 per year,

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$7, 2 years for United States, Canadian, and Mexican subscriptions. All other countries, $1 additional per year. Of interest to amateur astronomers. Articles, easy-to-use monthly sky and planet charts, space science information, and telescope making directions. (S-A)

ROCKET-JET FYLING. Pen-Ink Publishing Company. Published quarterly. $7 per year. An "ideas" publication devoted to the advancement of rocketry and jet propulsion. Provides up-to-date information on newest developments, and data useful in the design of reaction engines. (A)

SCIENCE. American Association for the Advancement of Science. Published weekly. $12 per year; school year subscriptions, $9 for 9 months; $10 for 10 months. Outstanding articles on newsworthy scientific happenings, discussions on vital issues, and presentations of scholarly reports and scientific papers. Numerous articles on space science subjects. (A)

SCIENCE BOOKS. American Association for the Advancement of Science. Published quarterly in September, December, March, and May. $6.50 per year; single copies, $2. Each issue includes critical evaluations by professional scientists, engineers, and mathematicians of more than 200 current books on scientific subjects, many of which deal with space science and astronautics. For all reading levels. (A)

SCIENCE NEWS. Science Service. Published weekly. $7.50 per year. A weekly news magazine of science and technology. Many articles on space research and exploration. (S-A)

SCIENCE WORLD. Scholastic Magazines. Published during the school year—28 issues per year, $1.65; 90 cents per semester for 14 issues. Feature articles, interviews with scientists, science news stories, and project ideas. Space science topics are included and a teacher's edition is provided with classroom subscriptions. (S)

SKY AND TELESCOPE. Sky Publishing Corporation. Published monthly. $7 per year; $8 per year, Canadian; $9 per year, foreign. Covers a wide range of topics of interest to both amateur and professional astronomers. (S-A)

SKYLIGHTS. National Aerospace Education Council. Published monthly—September through May, plus index. $2 per year. An eight-page publication including current aviation and space travel news, historical items, unusual aerospace facts and figures, aerospace education news, pictures, etc. Useful in providing background information for junior-senior high school students, for teachers and librarians. (U-S-A)

SPACE/AERONAUTICS. Conover-Mast Publications. Published monthly. $15 per year in the U.S. and Canada; $20 per year elsewhere; single copy, $1.25 ($1.70 foreign). Although written for aerospace engineers and scientists, many of the articles are nontechnical and would be useful to the general reader searching for information on such topics as new developments in aviation and space technology—aircraft, space vehicles, spacecraft, propulsion, life support equipment, and subsystems. (S-A)

SPACE WORLD. Palmer Publications. Published monthly. $7 per year. Feature articles and interviews with leading scientists, astronautical engineers, test pilots and planning experts covering manned and unmanned spacecraft, interplanetary flight, space probes and other subjects related to space exploration. Includes reprints of "hard-to-find" articles, and material on Soviet space activities. (S-A)

STUDENT ROCKETEER, THE. Rocket Research Institute. Published quarterly. $1 per year. Designed for student rocket clubs. (S-A)

WORLD AND U.S.A. NATIONAL AVIATION-SPACE RECORDS. National Aeronautic Association. Complete and up-to-date listings of official aviation and manned spacecraft records, issued by the NAA, which is the U.S. Representative of the Federation Aeronautique Internationale, the world authority for the certification of aircraft and space records. Published in loose-leaf, three-ring binder form, with replacement pages distributed to subscribers four to six times a year to keep record lists up to date. $15 for first year, including binder; $10 per year thereafter. (S-A)

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